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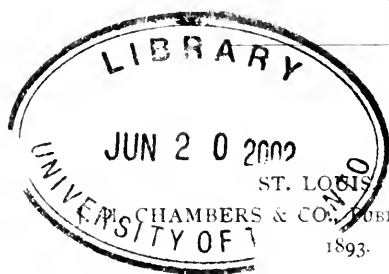
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VOLUME X, 1893



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THE AMERICAN JOURNAL OF

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VOL. X.

JANUARY, 1893.

No. 1.

ORIGINAL ARTICLES.

GLAUCOMA IN A GIRL EIGHTEEN YEARS OF AGE.

BY S. C. AYRES, M.D., CINCINNATI, OHIO.

Glaucoma so seldom occurs in a young person that I deem the following case of sufficient importance to report.

The patient was a German girl in excellent health, but she stated that for two or three years her sight had been failing. She had received no treatment of any kind and her eyes had not been examined until she was admitted into the St. Marys Hospital in October. In the right eye there was no perception of light. The tension was increased (+ 1), pupil dilated, fixed, and the eye diverged slightly.

There was a deep excavation of the disc and a ring of choroidal atrophy surrounding it. The most remarkable feature of the case was the size of the optic disc. It appeared less than half the normal size. It presented an appearance of a constriction of the scleral ring around the optic nerve.

In the left eye the pupil was dilated but responded very

sluggishly to light, the nasal side of vision was abolished but she still saw on the temporal side, and vision was reduced to 0.05. Under the influence of eserine vision improved considerably, the pupil responded to the myotic and tension became normal. The optic disc here presented an appearance similar to the right eye. There was a ring of atrophy around the disc, and the optic nerve presented an abnormally small diameter. The patient was promptly taken out of the hospital when a proposition to make an iridectomy was made to her parents.

TWO CASES OF GONORRHŒAL IRITIS.

BY ADOLF ALT, M.D.

Although the fact, that iritis may follow gonorrhœa of the sexual organ has been well established by a number of observers, the literature is not very rich in descriptions of single observations. The following two cases are not the only ones, that I have seen, but they were seen by me during their whole course and seem to be interesting enough to be here reported.

CASE I.—February 12, 1899, I was sent for to see J. H., æt. 17, a strong, well-built young man. I found him suffering from gonorrhœal conjunctivitis in both eyes. He stated to me that he had been under treatment for gonorrhœa of the urethra for three weeks which was followed by intense articular rheumatism a week after the gonorrhœa had made itself known to him. This rheumatism befell first the knee-joints, which were greatly swollen, when I first saw him, it then wandered to the hip-joints, then the shoulders, and elbows and wrists, and finally, but very slowly disappeared. It was as intensely painful as any articular rheumatism, I have ever seen, and the patient was not only utterly helpless but he gradually become enormously weakened and emaciated.

The gonorrhœal infection of the eyes had taken place in the third week, that is a week before I saw him. Under the local applications of a corrosive sublimate wash and nitrate of silver the lids improved steadily. While this improvement was going on several small marginal ulcers appeared in both corneæ, and in the right cornea a larger crescentic ulcer came near perforating. I discharged him March 6, that after is three weeks' treatment, in good condition. At that time the articular rheumatism was still troubling him greatly.

March 24, I was again called to see him. He complained now of considerable pain in the right eye, photophobia and lachrymation. I found the pupil small and immoveable, but comparatively little ciliary injection. I at once dilated the pupil and maximum. Several small pigment spots on the anterior lens capsule remaining behind, showed that although but a few hours had elapsed since the patient was aware of some new affection of the eye, several synechiæ had been formed. The attack of iritis proved to be a mild one and readily yielded. The knees and wrists were at that time still swollen.

CASE II.—February 10, 1891, W. R., æt. 20, was brought to my office by his family physician on account of a very painful eye affection which then had been in existence for a week. Four weeks before his first visit to me he had for the first time noticed the infection of his urethra and one week after that he had been attacked by severe articular rheumatism which, however, affected both knee-joints only. I found a very severe plastic iritis, which in the right eye only was very painful. The pupil never became perfectly round, some adhesions being too strong to give way to the atropine. Still under the use of the mydriatic and the internal exhibition of salicylate of sodium, the eye trouble subsided and was brought under control before the rheumatism was well. I was able to discharge him five weeks after his first visit to me.

The first of these two cases is somewhat uncommon by the fact, that gonorrhœal conjunctivitis and ulcers of the cornea had preceded the iritis. It is not to be denied, that the infection of the iris may have been brought about by the direct entrance into it of the virus from the corneal tissue. In the second case the infection of the iris occurred without the previous formation of a focus of infection in its immediate neighborhood.

CORRESPONDENCE.

OPHTHALMOMETRY IN THE UNITED STATES AND ITS CHAMPIONSHIP.

To the Editor of the AMERICAN JOURNAL OF OPHTHALMOLOGY :

SIR.—It is a matter of small concern probably to the profession at large as to who shall have the honor of being the champion of ophthalmometry in this country. It seems, however, that it is a matter of a good deal of concern among a set of oculists in New York and they do not seem backward about making themselves heard in regard to it.

Dr. Davis, in a communication in the *New York Medical Journal* for December 24, 1892, is very decidedly of the opinion that it belongs to Dr. D. B. St. John Roosa, of New York, and he has stated without reserve the reasons for the faith that is in him. Other people have other preferences in the matter of championship, and one or two have happened to mention, casually, in some papers they have written on the subject of ophthalmometry, that I myself did some work with the instrument several years ago, and that I did not hesitate to say on several occasions, in print, how very good an instrument I regarded it, and how very important it was in working out astigmatism. *Hinc illæ lacrymæ.*

My first statement to that effect was made in an article on "Ophthalmometry with the Ophthalmometer of Javal and Schiøtz," etc., in *Knapp's Archives*, 1885, Nos. 2 and 3. I said there, after a constant use of the instrument for six months, that "I consider it the most practical of all the instruments of precision we have in the diagnosis of astigmatism." It would appear further, that even at that remote period, the instrument had been removed (by me at least) from the limbo of being a

mere "scientific toy," for I say that "I could hardly imagine a practicing oculist who could not manipulate the instrument with success, certainly to the extent of detecting an astigmatism of 0.5 D."

This article, it is true, was not published in the daily papers, nor in a popular monthly magazine, but in the *Archives of Ophthalmology*, which is, or should be, on the table of every practicing oculist in this country, and it was intended to reach those whom it most concerned. I said other things about the instrument which were intended to be complimentary and at the same time truthful and demonstrable. My teachers, Mr. Editor, had always tried to impress upon my mind the fact that unrestrained enthusiasm was a bad thing for science—a sort of boomerang, which came back at inopportune moments and caused you to dodge ungracefully; and I have never been sorry when I have heeded their wise council.

I chanced to publish a "Treatise on Astigmatism" about two years after that (in 1887), and in giving what I believe is the first description of the instrument in English, I felt warranted in saying, among other things, from my further experience, "that in my estimation it must be regarded as the most important, practical and exact means of diagnosis given to our science since the invention of the ophthalmoscope" (page 124). Dr. Davis looks upon this in the light of "faint praise." *Que voulez vous?* I did not print it in red letters, nor yet in capitals or italics. There are some things, Mr. Editor,—particularly very patent facts—which I prefer to leave, without marked insistence, to the intelligent comprehension of the reader.

If my information is correct, this was two years before the appearance of the "New Model," and while the ophthalmometer was still, according to Dr. Davis, "a discredited instrument." Later (in 1888), I read before the American Ophthalmological Society a paper containing "An analysis of the refraction of 576 healthy human corneæ examined with the ophthalmometer of Javal and Schiøtz." In this I showed how all but a very small proportion of astigmatism was corneal and

how invaluable a means for its detection was the ingenious apparatus of Javal. This paper was published in the Transactions of that year. Subsequently to this I have published, at various times and in sundry places, other papers on the same subject, giving the results of my experience with the instrument and always speaking of it in great praise and in thankfulness to its clever inventor who has become my personal friend.

Now it is possible that none of these communications during this period reached the eye of either Dr. Roosa or Dr. Davis. Life in the great metropolis is carried on under so great a pressure that it sometimes happens that concentrated attention to matters of local moment prevent some of our New York brothers from having a knowledge of the unimportant and insignificant things that come from the outside. But I am a little sorry that neither Dr. Roosa nor Dr. Davis happened upon these papers, for if they had read them at the time with an open mind they might have been led to a knowledge of the great value of the ophthalmometer and have begun its use several years ago and given their patients the benefit of its employment, the lack of which must be a source of great sorrow to them now.

It must be admitted however, that Dr. Davis now, for the first time, concedes the priority of first description and first use of the ophthalmometer to the Barbarian outside the walls, and hinges the whole of his argument for the championship on the fact that the Greek has chosen to make it his own (in the usual way), has set the stamp of his approval upon it and has announced the fact with a flourish of trumpets of no uncertain sound, putting no limitations upon the instrument either possible or actual—in political parlance, “claiming every thing.”

Proselytes and new converts are always most vociferous in their praises of the new found Gods.

Ideas of what it takes to constitute a championship may be widely different. It is largely, it must be confessed, too, a matter of taste. One conception would be to strip to the waist *à la* Prof. John L. Sullivan, “wade in” and “put a head

on" any one who refuses to recognize the omnipotence of the ophthalmometer, and Dr. Roosa as its Prophet.

This would seem to be Dr. Davis' idea.

Another plan is to set forth the actual value of the instrument in a calm and deliberate manner, paying due regard to what it can do and what it cannot do; "nothing extenuate nor set down aught in malice." True science has a negative as well as a positive side, and Truth is comprehended between the two. This latter method, which in my humble efforts I have tried to follow has also been used by Drs. De Schweinitz, Eaton, Koller, Noyes, Valk, Woodward, and some others who have written and spoken upon the ophthalmometer in this country, and to these men is due in a large measure the present proper esteem in which the instrument is held in America.

The championship of ophthalmometry in America does not belong to any one man. I distinctly repudiate it for myself in any limited or personal sense; and I have not allowed any of my pupils or assistants to claim it for me. I only claim that I knew a good thing when I saw it, and hastened to tell my fellow-workers how very valuable I deemed it and asked them to try it for themselves.

But if we are to have a champion (and Dr. Davis seems to think we must), we would probably come nearer a choice if we left it to the best authority on the ophthalmometer, we have—none other than the inventor of the instrument—Dr. Javal himself.

He has spoken on the subject, for in his *Memoires d'ophthalmometrie*, published in Paris, in 1891, in the preface, on page vi, we find the following which, in deference to my modesty, I trust you will allow me to quote in the original:

"En parcourant ce volume on s'apercevra bientôt que l'ophthalmometrie clinique doit son progrès en Amerique à M. Swan M. Burnett, que s'en est fait le premier champion."

But perhaps Dr. Davis is not willing to recognize Dr. Javal as an authority on championships. However, I fear that, considering we have no higher court of appeal, we shall have to let it rest at this.

And I should be glad to allow the whole matter to pass out of sight at this closure of the case, were it not that among the many mis-statements and misrepresentations in Dr. Davis' letter there are two or three of such quality and magnitude that I cannot permit them to go by without a protest and a flat denial, partly from scientific and partly from personal reasons.

I do not allude to the attempt to associate in the same category Dr. Landolt, who is not an advocate or a friend of the instrument, and myself who am both, by garbled extracts from our writings. This is so clumsily done that its animus is apparent upon the face of it, and it is a sufficient answer to itself. But when he goes on further and says that "in fact Burnett, in his first paper on ophthalmometry, gave drawings made from measurements of the cornea by the disc of Placido; in some respects he claimed it to be superior to the ophthalmometer," the long suffering of the Barbarian even must give way. I will quote, Mr. Editor, exactly what I did say, and what can be found on page 171 of that paper: "No other form of keratotomy can be compared to it (the ophthalmometer) for precision and accuracy. I have used Placido's disc and Wecker's Squares, but must confess that I found them worthless in regular astigmatism." The statement of Dr. Davis is wholly the product of his fertile imagination. The drawings referred to were of a case of keratoconus of remarkable regularity which could be shown graphically only by means of the keratoscopic drawings. The measurements of the ophthalmometer, which furnished a clue to the regular astigmatism associated with it, are given, however, with laudatory praises of the instrument without the aid of which it could not have been done.

Moreover, when he says that "Dr. Roosa took a discredited instrument and brought it into wide use and good repute," there is an implied imputation and slur upon some of our best workers and most esteemed practitioners for which there can be no defense. Who brought it into discredit? Dr. Roosa's use of the instrument began three years ago or less, but if either he or Dr. Davis had taken the trouble to walk a few blocks to the office of Dr. Noyes in New York, even so far

back as in 1885, they would have found that he was doing some very creditable work with it indeed, even with the old model, as good work as has been done with the new model any where to-day. Indeed, I am of the opinion that Dr. Noyes was the first on the Atlantic coast to use the ophthalmometer regularly, certainly as early as any; as Dr. Martinache, I have been told, was the first to use it on the Pacific coast. Dr. Noyes' first public advocacy of the instrument, was, I think, in 1888, but he has since that time never allowed an opportunity to pass without stating in forcible language his high appreciation of the ophthalmometer as a practical instrument. Certainly Dr. Noyes' advocacy of the ophthalmometer cannot be considered "discreditable" nor can that of Dr. Koller, who imported his enthusiasm for it with him from Europe, whence he came in 1887.

It may be well to communicate, just here, some facts which may prove important information for some who are really in search of it, and that is that the scientific principles of the ophthalmometer are precisely the same in the new and in the old model. If any one understands the one he understands the other; and though Dr. Davis seems to know that I have never used the new model, I have to inform him that I have not only used it but have instructed a number of novices in its employment. Furthermore, I have no hesitation in saying that in some particulars (for instance in the matter of getting the meridians exactly), the older form is the better, and in this opinion I am backed by one near the throne at Paris; and some in this country who have used both models would be glad to get one of the old if they could. The change to the new model was not wholly a matter of scientific necessity, as some of us happen to know.

But the real claim to a championship is, I suppose, set forth in the closing paragraph: "It was Dr. Roosa who took the perfected instrument and by his unceasing advocacy of it, both in writing and teaching, demonstrated its great practicality not only in cases of aphakia, *but in all cases of refraction.*" Italics his. The only thing that we can infer from this is that

Dr. Roosa holds that the instrument is practicable for the detection and diagnosis of hypermetropia, myopia and general astigmatism as well as corneal astigmatism; certainly that can be the only signification of "all cases of refraction."

I do not think that any one who has any knowledge of physiological optics or of the principles of the ophthalmometer will dispute with Dr. Roosa for the championship of that claim. If he can do all which that claim implies we will willingly and gladly crown him King of Ophthalmometrists, and hasten to make pilgrimages to New York to sit at his feet and learn. But we must bring this already too long communication to a close, though in doing so I would ask you to allow me to point the moral which should adorn any tale worth the telling, and it is this:

Firstly. Let the ophthalmological Youth first make himself familiar with the facts and then not tamper with them overmuch.

Secondly. Let him not presume too greatly on the ignorance, stupidity or forbearance of the Barbarian.

I am, sir, yours most truly,

SWAN M. BURNETT.

Washington, December 28, 1892.

OPHTHALMOMETRY IN AMERICA.

[We reprint in the following the letter referred to by Dr. Burnett in order to afford the reader an intelligent understanding.]

To the Editor of the *New York Medical Journal*:

SIR.—In the *New York Medical Journal* for November 19th, under the heading of Ophthalmometry in America, you have published the introductory historical remarks of a lecture on Corneal Astigmatism, presented at a meeting of the Philadelphia County Medical Society, on October 26th, by Dr. G. E. de Schweinitz, of Philadelphia. In these remarks Dr. Swan M. Burnett, of Washington, is characterized as the "champion

of ophthalmometry in America." It is with all that candor and fairmindedness due one professional brother from another that I am obliged to dissent from the claim made by Dr. de Schweinitz, and to ask you to allow me to give my reasons for so doing.

While undoubtedly to Dr. Burnett belongs the honor of having *first* used the ophthalmometer (old model, he never having used the new model so far as my knowledge goes; at least, he has given no description of it), and also of having *first* written upon the subject of ophthalmometry in America, he has by no means and in no sense been its *champion*, nor did he popularize the instrument as it now is. The honor of the championship of ophthalmometry belongs to another man—to D. B. St. John Roosa. As everybody knows, a champion for anything is one who contends for it, not one who simply describes it. The latter is what Dr. Burnett did for the ophthalmometer. It was faint praise he gave it. Never did he claim that its use surpassed other methods of measuring astigmatism, especially the astigmatism of the eye as a whole. Dr. de Schweinitz's words themselves constitute Dr. Roosa the champion when he describes what he has written in behalf of the ophthalmometer as "an earnest advocacy of its employment—an advocacy that has never ceased, and has never been couched in words of an uncertain tone."

The instrument—the old model—when first shown by Javal and Schiötz in 1881, in London, and later when used in America, seems to have been regarded by those who saw it, and even by those who used it, as a scientific toy. Certainly but little more value was given it than to the disc of Placido or the squares of De Wecker. In fact, Burnett, in his first paper on ophthalmometry, gave drawings made from measurements of the cornea by the disc of Placido. In some respects he claimed it to be superior to the ophthalmometer. Two years later, in his *Treatise on Astigmatism*, when describing the ophthalmometer, in one paragraph he declares "the value of this keratometer in the diagnosis of astigmatism can hardly be overestimated," while in the preceding paragraph he says: "As it

is not possible with this instrument to examine with any degree of accuracy the lenticular surfaces, and as these form important elements in the general optical condition of the eye, the apparatus is of limited advantage in obtaining the refraction of the eye as a whole, except in cases of aphakia. Its usefulness for estimating general ametropia is still further diminished by the fact, which the instrument itself has done so much to establish, that the conditions of myopia and hypermetropia are not due, except in rare instances, to variations in the refracting surfaces of the eye, but to changes in the antero-posterior diameter of the eyeball."

This paragraph certainly shows lack of faith in the instrument except in cases of aphakia, and in this respect Burnett's opinion coincides with that of Landolt, who does not use the ophthalmometer at all, I believe, and has just as little faith in it, except in cases of aphakia, as Burnett, as is shown by a quotation from him (Landolt) made by Dr. F. B. Eaton, of Portland, Oregon, in a recent article,¹ as follows: "These instruments may render service when the dioptric system of the eye is reduced to the cornea alone, in aphakia. But in an immense majority of cases the determination of the curvature of the cornea is far from sufficient to acquaint us with the amount of astigmatism." Then Dr. Eaton goes on to say himself: "Later clinical experience of many observers proves that the above statement is incorrect, for, on the contrary, it is known now that in the great great majority of cases all but one-half of one diopter of the astigmatism is caused by unequal corneal curvature."

If this is so, as it certainly is, then it is unfortunate for Burnett, as a champion, that, in regard to "obtaining the refraction of the eye as a whole" with this instrument, his opinion and his words are nearly identical with those of Landolt, who is anything but a champion. Compare quotations from each. Burnett: "The apparatus is of limited advantage in obtaining the refraction of the eyes as a whole, except in cases of aphakia."

¹Medical Record, Nov. 12, 1892, p. 573.

Landolt: "These instruments may render service when the dioptric system of the eye is reduced to the cornea alone, in aphakia."

The honor of having championed and popularized the ophthalmometer in America belongs to Dr. Roosa. It was introduced to the profession by those to whom we shall always be ready to give honor. But, as they themselves did not believe in the value of the instrument except in a very limited way—much below what Javal and Schiötz claimed for it—it is no wonder that the introduction was forgotten and the instrument generally consigned to the limbo of obscurity. It was scarcely noticed by oculists in general. It was taken for granted from the method of its introduction that it was not at all an essential instrument, as is now claimed.

Dr. Roosa took a discredited instrument and brought in into wide use and good repute. No one, I think, will, or can for that matter, claim that the old instrument was in any sense a popular one in America, it being only in the offices, so far as I can learn, of not more than six oculists—certainly not more than twelve—and in some of these offices was put aside in the lumber room. That the new modeled instrument could have been popularized from a description of the old is out of the question. I doubt very much if the new instrument could be used at all from the description of the old, and I am sure it could not be accurately employed.

It was Roosa who took the perfected instrument, and by his unceasing advocacy of it, both in writing and in teaching, demonstrated its great practicability, not only in cases of aphakia, *but in all cases of refraction.*

December 1, 1892.

A. E. DAVIS, M. D.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, OCTOBER, 20, 1892.

HENRY POWERS, F. R. C. S., President in the Chair.

ON DEFECTS OF THE IRIS IN RELATION TO GLAUCOMA.

Mr. Treacher Collins gave a lantern slide demonstration of the microscopical character of three eyes with defects of the iris: (1) congenital absence of the iris and opacities in the lens; (2) congenital coloboma of the iris and lens outwards, with glaucoma; (3) traumatic aniridia and glaucoma. In the first specimen the ciliary body ended in a rudimentary iris in its entire circumference, although none could be seen before removal of the globe. On one side of the section a small piece of the sphincter muscle was present; on the other no such structure could be made out. The uveal pigment on the back of the iris ended at the pupillary border in a double fold, and there were abnormal adhesions between the ligamentum pectinatum and the root of the iris, and remnants of the pupillary membrane. Besides other opacities in the lens, there was one at its anterior pole raised above the surface and evidently due to subcapsular proliferation of the lining epithelium.

Mr. Collins thought the arrest of development of the iris, as well as the other changes found in this eye, could be explained, as suggested by Manz, by an abnormal adhesion or late separation of the lens and cornea, which mechanically prevented the growth inwards of the iris. He pointed out that there was

quite sufficient iris in this case to block the whole filtration area, should it have become pushed forwards, and that it was therefore quite possible for eyes in which no iris could be seen to become glaucomatous.

In the second case the filtration area in the region of the coloboma of the iris was found closed in more than half its extent by a small process with a double layer of pigment on its posterior surface, in which the ciliary body terminated. The ciliary processes opposite the cleft in the lens were directed backwards. This he thought due to the absence of any forward traction by the fibres of the suspensory ligament, which were probably wanting in that position.

In the third case there had been a wound of the cornea, through which the whole of the iris and a great portion of the lens had escaped eight and a half months previous to excision. The eye became glaucomatous, with a deeply cupped nerve. There was a broad adhesion of the lens capsule to the corneal cicatrix. The advanced position the lens had thus taken up had drawn forward the ciliary processes, so that the most anterior of them were in contact with the cornea and blocked the filtration area.

DOUBLE NEURO-RETINITIS AFTER INFLUENZA.

Mr. Hartridge reported this case. The patient, a girl, aged 16, suffered from a severe attack of influenza in May, 1892, and a second but less serious attack in June, 1892. The latter illness was quickly followed by gradual and progressive failure of vision. The acuteness of vision is now ⁶ _{XVIII} in each eye, with correction of some astigmatism. The patient has suffered during the past six weeks from constant headache on the right side. The optic discs are white, blurred, and rather swollen; arteries slightly diminished in size, veins somewhat tortuous, white lines along some of the large vessels, numerous bright scattered patches in the macular region, no hemorrhages. There has been no evidence of renal disease; the patient is decidedly anemic, but well nourished.

Messrs. Doyne, Hodges, and Juler referred to cases they had seen in which the ophthalmoscopic appearances closely resembled those present in Mr. Hartridge's patient, and in which there was a history of antecedent influenza.

Dr. James Taylor thought that in Mr. Hartridge's case the evidence as to influenza was not very definite, and suggested that the symptoms mentioned and the ophthalmoscopic appearances might be indicative of cerebellar disease.

Mr. Richardson Cross gave a brief account of three cases of optic nerve disease following attacks of influenza. In one the optic nerves were inflamed; in the other two they were, when seen by Mr. Cross, in an atrophic stage. All three patients were females, aged 20, 25, and 50 respectively. He felt satisfied that optic neuritis was occasionally caused by influenza.

Mr. Tweedy spoke of one of Mr. Cross's patients, whom he had also seen. He was of opinion that influenza bore a casual relation to some cases of neuritis, and not of the optic nerves alone. He had seen cases of paralytic strabismus following influenza which he thought were caused by a neuritis of the motor branches supplying the ocular muscles.

THE OPTICAL CONDITION OF FIFTY PERSONS WHO WERE FREE FROM ANY OCULAR DISTURBANCE.

Mr. Work Dodd read notes of observations on the sight of fifty individuals who had made no complaint concerning their eyes. The principal points brought out by his investigation were as follows: The average interpupillary distance, measured with a steel metric measure, the eyes being directed to infinity, was 6.012 centimetres. The average convergence, measured from the punctum remotum by means of graduated prisms, was 1.24 metre angles; and for the punctum proximum, by the ophthalmo-dynamometer of Landolt, 10.86 centimetres; the amplitude of convergence being 11.08 metre angles. The punctum proximum of accommodation ascertained by the same instrument was for the right eye 10.10 centimetres, and for the left 10.38 centimetres; the amplitude of accommoda-

tion for the right eye 12.53 dioptries, and for the left eye 12.50 dioptries. The punctum proximum being nearer to the right eye in 24 cases, to the left in 15, and equal in 11. The amplitude was greater in the right eye in 28 cases, in the left eye in 17, and equal in 5. The visual acuteness and refraction, both before and after mydriasis, were obtained by means of Snellen's distant type and the ordinary trial lenses. Visual perception, before mydriasis, was more acute in the right eye in 15 cases, in the left eye in 12, and was equal in 23. After mydriasis it was more acute in the right eye in 15 cases, in the left in 14, and was equal in 21. The amount of ametropia preponderated slightly in the left eye. There was simple hypermetropia in 39 instances, and myopia in 1. Simple hypermetropic astigmatism existed in 1 case, and compound hypermetropic astigmatism in 4; 4 also were anisometric. The oculation was dexter in 24 cases, sinister in 15, and indifferent in 1. This last point was determined by directing the patient to fix his eyes on a distant object, and then to hold up a small key or finger-ring at arm's length, so that he looked through it at the object. The ring in any case would be placed in the line of fixation of one particular eye, and the closing of that eye would make the ring appear to move quickly to that side, away from the object; while, on the other hand, the closing of the other eye would have no effect. To prevent the choice of hand exercising any influence on the experiment, the left was employed first in right-handed subjects, and *vice versa*, but without modifying the result. The choice of eye being apparently determined by the absence of ametropia and the greater visual acuteness in one eye more frequently the right.

LIVING AND CARD SPECIMENS.

Mr. Powor—Recurrent Spindle-celled Sarcoma of Lacrymal Gland.

Mr. Juler—1. Melanotic Tumor in Ciliary Region; 2. Retinal Hemorrhage.

Mr. Doyne—1. Unusual Form of Keratitis; 2. Recovery from Albuminuric Retinitis of Pregnancy; 3. Atrophy of Lacrymal Gland.

Mr. Morton—Drawing of Cyst of the Iris.

Mr. Beaumont—Neoplasm (? Sarcoma) of Iris.

THURSDAY, NOVEMBER 10, 1892.

CONJUNCTIVITIS SET UP BY FLIES.

Dr. Berry (Edinburgh) read notes of two cases:

1. An old man in whom severe inflammation of the conjunctiva, accompanied by extensive ulceration of the cornea, came on within twenty-four hours of his having been stung in the eye by a fly which had apparently risen from a dunghill. In addition to the local disease there was a marked general prostration, and the patient remained in a feeble state of health for months afterward. The whole course of the case seemed to indicate that the poison carried by the fly had produced the local inflammation and also some general poisoning.

2. A man, aged 20, in whom acute swelling of the right eyelid and conjunctiva came in two days after a fly had got into his eye. The inflammation soon became unmistakably diphtherial, and led to complete destruction of the cornea and very serious general symptoms. Dr. Berry was not prepared to state positively that the diphtherial poison was introduced by the fly, yet the rapidity with which the symptoms followed the accident he thought was at least suggestive.

Mr. Craiger related a case he had seen at Moorfields Hospital, which was, he thought, in some respects analogous to the cases mentioned by Dr. Berry. It was that of a stableman who was struck in the eye by a worm from the intestines of a horse. When he came to the hospital a few hours later there was very marked chemosis of the conjunctiva, which gradually subsided. Mr. Craiger thought this might have been due to the introduction of some poisonous material contained in the excreta of the horse.

HYPERPLASTIC SUBCONJUNCTIVITIS.

Dr. Berry described a group of cases under the above title. In these cases a hard swelling could be felt occupying the tissues below the conjunctival fold of the lower lid. This was in some instances associated with the irritation and discomfort common to chronic conjunctivitis. Dr. Berry thought, from clinical experience, that the subconjunctival infiltration originated at a time when the conjunctiva was inflamed, and, for some reason, was not altogether absorbed afterward, although the overlying conjunctiva regained its normal condition. And, moreover, an independent hyperplasia might arise in this more or less organized deposit, causing it to swell to a greater or less extent, and to be accompanied by symptoms of irritation. In pronounced cases, the conjunctivitis was often very slight, although chemosis and swelling of the preauricular gland might be present.

Mr. Lawford thought he recognized the condition described by Dr. Berry as hyperplastic subconjunctivitis. He asked if Dr. Berry had met with it more commonly in old or young patients, or in connection with any dyscrasia, and would be glad to know what plan of treatment he had found most suitable.

In reply, Dr. Berry said that hyperplastic subconjunctivitis was generally met with in adults; chronicity was one of its chief characteristics. In one instance in which he had given salicin, thinking the condition might be rheumatic in nature, improvement had ensued.

INTRAOCULAR INJECTION OF ANTISEPTIC SOLUTIONS.

Dr. Berry gave an account of some facts elicited during experiments on rabbits, undertaken by his assistant, Dr. Chas-saud, with the object of ascertaining the effect of different solutions injected into the vitreous. In some cases, before injecting the antiseptic, the vitreous was inoculated with fresh septic pus. The only substance injected after the inoculation

which seemed capable of preventing purulent hyalitis was chlorine water. At the same time this injection was much better tolerated by the retina and vitreous than any other strong antiseptic solution. In two cases of purulent hyalitis in men, chlorine water injected into the vitreous led to immediate improvement, and the eyes were saved, although sight had been lost before the treatment was adopted.

Dr. Hill Griffith (Manchester) suggested that the trichloride of iodine promised to be very suitable for intra-ocular injection. It was said to be non-irritating and to become decomposed in the tissues into free chlorine and iodine.

Mr. Hartridge thought that cases frequently occurred in which the injection of antiseptic and germicidal solutions into the eye seemed most desirable, and, if it were shown that this treatment could be safely adopted, we might oftentimes save which now had to be removed.

Mr. Doyne referred to one case in which he had injected boric acid solution into the anterior chamber, and in which arrest of suppuration had resulted.

In replying to these remarks Dr. Berry thought it probable that in the use of intra-ocular injections a distinct advance in ocular therapeutics might be made. He pointed out that injections into the anterior chamber and into the vitreous could scarcely be compared. He had frequently used solutions of perchloride of mercury to wash out the aqueous chamber, but usually with resulting opacity of cornea. The opacity he had noticed to occur less markedly in children than in adults.

INTRAOCULAR ABSORPTION OF IODOFORM.

Dr. Berry recorded a case in which, after extraction of senile cataract, he applied iodoform freely to the wound. On examining the eye next day the anterior chamber was found to be filled to the extent of apparently two fifths of its capacity with iodoform, and the rest of the aqueous to be turbid. At some parts caked portions of iodoform could be seen plastered as it were upon the iris. The iodoform was gradually absorbed

without causing any great irritation. In a fortnight no trace of it could be seen, and the result of the operation was good. Although he had very frequently applied iodoform after removal of cataract, he had never known it penetrate to the anterior chamber; he thought the fact that it could thus undergo absorption one of interest.

LIVING AND CARD SPECIMENS.

Mr. Stanford Morton—Cyst of Iris.

Mr. John Griffith—Rupture of Sclera Without Marked Defect of Sight.

Mr. Hartridge—1. Multiple Ruptures of Choroid; 2. Case of Aniridia.

Dr. Work Dodd—Case of Aniridia.

SELECTIONS.

NYSTAGMUS.

BY HAROLD N. MOYER, M. D.

Adjunct Professor of Medicine, Rush Medical College, Chicago.

The diagnostic relations of nystagmus while not as important, because not so frequent, as other disturbances about the eye, are still sufficient to merit passing mention. Our standard text-books on nervous diseases present a rather wide divergence as to its significance. If we divest ourselves of the view that nystagmus is in some peculiar manner associated with central nervous disease, in much the same way as optic atrophy or papillary changes are; and will regard this condition as an example of hyperkinesis analogous in many respects to other forms of tremor and rhythmical spasm we shall arrive at a much more correct understanding of its diagnostic relations.

Buzzard¹ evidently regards nystagmus as a very grave symptom. In his article on simulation of hysteria, in dealing with the subject of insular sclerosis, he says that were the ophthalmoscope shows atrophy of the disc a diagnosis of functional disorder must be discarded, and the same must be said of nystagmus.

In this view he is evidently mistaken, for no case of simple spasm of a muscle can ever be said to have the same organic basis as one involving paralysis or atrophy of a peripheral nerve. Unquestionably nystagmus is rare in hysteria, but

¹Dictionary of Psychological Medicine, page 1163.

cases have been reported, notably those by Hogeny,¹ in which the symptom could be produced at will in certain hysteronepileptics.

Nystagmus is essentially a neurosis, and the changes which produce this condition are to be found in the nerve trunks or centers. Its value as a sign of central nervous disease lies, therefore, in the anatomical relations of the nerves and centers governing the movements of the extrinsic muscles of the eye ball.

Ross² divides all of these cases into two classes, local and central. To the first he assigns those cases dependent upon congenital defects of the optic nerve and retina, pigmentary retinitis, congenital cataract and corneal opacities. The second class he regards as due almost invariably to disease of the cerebellar peduncles, though he mentions basilar meningitis, hydrocephalus and other intra-cranial processes as occasionally giving origin to the symptom. It is apparent from his description that, like Buzzard, he regarded this condition when not associated with gross defect in the eye-ball as almost certainly indicative of organic cerebral disease. Again he says that nystagmus is always bilateral, though Banham³ presented to the Sheffield Medico-Chirurgical Society a case of uniocular nystagmus, in a patient affected with a cerebral tumor involving the peduncle and pons.

It is apparent that a classification into local and central is inadequate as is also the view that the condition is always dependent upon changes in the eye-ball or organic disorders of the brain. That the disease may be "functional" is attested by the hysterical cases of Hogeny and by one of my own patients. The latter was a man 45 years of age, actively engaged in literary pursuits, and the administration of a public office. He was of temperate habits, but used tobacco moderately and the lighter wines with meals. Some six years ago

¹Orvosi Hetilap—Centralblatt f. Nervenheilkunde. 1886.

²The Diseases of the Nervous System. Vol. I. 333.

³British Medical Journal, 1885.

he was suddenly affected with marked horizontal nystagmus. There were no other symptoms of nervous trouble, no change in the fundus of the eye, or in the accommodation, a slight degree of presbyopia having appeared some years before. The nystagmus persisted for some months and gradually disappeared; the patient has since remained in good health.

Dennett⁴ advances an ingenious theory to account for nystagmus observed in anomalies of the refractive media or from faults of development or diseased conditions of the retina or percipient apparatus. The visual power being greatly impaired in these cases the motion is attributed to the effort of the patient to compensate for the impaired function by obtaining the image on two parts of the retina at nearly the same time. This ingenious explanation is suggested by the fact that amblyopic patients can distinguish objects that are moving with greater distinctness than when at rest. Again, in looking at some fixed point, say a star, we are able to distinguish it with greater clearness if for an instant we look a little to one side.

This explanation, while it satisfactorily accounts for the condition when due to pigmentary retinitis, or opacities of the and lens, does not suggest the origin of the condition in the following case: S. C., a German, 34 years of age, presented himself at the clinic for nervous diseases, of the Central Free Dispensary, he did not come for treatment, but accompanied his wife. He was noticed to have marked nystagmus, which he said had existed since his earliest recollection. The movements were mainly horizontal, but occasionally slight rotation could be observed. The spasm increased as the near point receded or the vision was fixed upon a distant object. When the eyes were focused upon a point ten inches from the face all movements ceased. The pupils were normal, as were the refracting media and the eye grounds. Vision was excellent, though the patient complained of fatigue after reading a considerable time.

⁴Reference Handbook Vol. V. 270.

In this patient the condition was congenital and must be referred to some want of development in the nerve centers governing the movements of the eyes.

A brief study of nystagmus shows that it occurs in a variety of conditions, the more important of which are:

1. Congenitally defective vision, microphthalmus, coloboma, etc.
2. Congenital defect in the motor nervous apparatus without impairment of vision.
3. Occasionally in functional nervous disorders.
4. As an essential condition disconnected from all other diseases of the nervous system.
5. In certain occupations, notably colliers, who work with the eyes in a constrained position. In these cases the trouble seems to be related to the neural disorders of artisans, and tends towards recovery on change of employment.
6. Associated with disseminated sclerosis, Friedreich's disease and rarely with locomotor ataxia.
7. Accompanying various pathological changes along the base of the brain and in the medulla and pons.—*North Am. Pract.*

SYMPATHETIC OPHTHALMIA.

BY PROFESSOR PANAS.

GENTLEMEN.—Our patient is forty-three years of age, in good health, with no venereal antecedents. In fact, with no symptoms or history of any kind that would lead you to correct diagnosis. Two years ago, in stooping to pick up the branch of a tree, he received a contusion of the right eye without any wound. The sight was lost at this time, but it gradually returned, and then was lost again. In June last he began to see floating objects before his left eye, and photo-

phobia developed. The inflammation was slight, but the vision of the eye was in danger, as the visual field was found narrowed in a concentric direction, some ten to fifteen degrees. If you examine his right eye, the one that was first attacked, you will find that the pupil is large and widely dilated. The iris looks like a small ring, this paralysis must not be placed to the account of the amblyopia, for it is a true iridoplegia. And there is besides iridodonesis, which prove that the crystalline body is not in the right place; there is, in fact, a subdislocation of the crystalline lens, caused by the rupture of the capsule. At the back of the eye a glaucomatous excavation is seen, and all the vessels of the retina are pushed over to the nasal side. The tonus is only slightly raised. There can be no doubt that the excavation is caused by the compression and atrophy of the optic nerve. The eye shows no exudation or inflammation,—nothing at all, in fact, to indicate an inflammatory complication. The left eye, however, presents a trace of inflammation, as we find a deposit of pigment there. With the aid of the ophthalmoscope you can see opacities of the vitreous body, but through this foggy appearance you can perceive indistinctly the papilla and around it some discolored plaques in the choroid. From this we conclude that a subacute inflammation of the neuroepithelial coat of the retina and of the iris exists. This, then, is a case of *sympathetic ophthalmia*, an affection whose evolution is as yet but poorly understood. It is, however, a very important condition, a knowledge of which is essential, not only to an ophthalmologist, but also to every doctor who may be called upon to treat a wounded person or give a medico-legal certificate.

Sympathetic ophthalmia occupied the attention of many ancient writers, but up to Mackenzie's times nothing of importance had been done. He supposed that the optic nerve and tracts were the means by which the inflammation was propagated to the other eye, and advised enucleation as the best means of treatment. Other authors concluded that the ciliary nerves were a fault. The belief they based on the

clinical fact, that all wounds having their seat in the ciliary nerves predisposed the person to sympathetic ophthalmia, while the wounds of other parts of the eye—the cornea, for instance—are very rarely followed by sympathetic ophthalmia. I have only once seen it follow an operation for cataract.

Another important fact is that the traumatism of the ciliary region will cause sympathetic ophthalmia, whether the wound be an open one or not, so that it is not correct to suppose that the infection which causes it must necessarily come from without. Our patient is a living proof that the pathogenic cause did not come from outside his eye. The commotion of the ciliary region with the paralysis of the iris and rupture of the zonule were not accompanied by any solution of continuity. The pathogenic part taken by the ciliary region has been attributed to the presence of a great number of sensory ciliary nerves, which give rise to reflex vaso-dilating action. This is the prevalent opinion of such writers as Rondeau and Reclus.

With Pasteur's discoveries, bacteriology aided in deciding the question, Leber and after Deutschmann, guided by the ophthalmoscope and their anatomical studies, seemed to return to Mackenzie's theory, and stated that the inflammation was transmitted from one eye to the other by means of the optic nerve, from which they called it "*ophthalmia migratoria*;" to prove it, they injected into one eye of the rabbit a culture of the pyogenic microbe, and they claimed that the inflammation was propagated to the other eye by the optic tract. But these experiments have been done many times since, and the results are not at all sure, so that we must not accept this theory as proved. At the last congress at Heidelberg Schmidt, Pflueger, Laqueur, and others spoke against it. If we cannot accept this theory, we certainly cannot admit the advisability of an operation or attempts to prevent sympathetic ophthalmia by section of the optic nerve or resection combined with abrasion of the ciliary nerves and vessels.

We can add that this operation often results in a hæmatoma of the orbit, marked protrusion of the globe, and death by

meningitis, and that this happens much more often than has been said or written. For these reasons I remain convinced that the best thing to do is to resort to enucleation as the most reliable means of preventing sympathetic ophthalmia. This operation done under antiseptic methods is the best treatment for such patients.

I do not mean that it is the only thing that can be done, but simply that such a surgical operation is not harmful in itself and it has given the best result as a preventive treatment against this trouble. But once you have the sympathetic ophthalmia started you cannot hope to cure it by operation. The mercurial treatment must then be employed. This can be done by rubbing the ointment into the eye, or by hypodermic injections. I have reported a number of cases treated in this way. I must also mention in this connection the treatment proposed by Drs. Abadie and Darier, who make intra-ocular injections of a solution of one to one thousand of corrosive sublimate, combined with the use of the actual cautery; applications to the site of the wound with thermo-cautery may also be employed. This method is still, however, under trial as to its merits. It may be good when the eye is not completely lost, and when the mercurial treatment has had no effect.—*International Medical Magazine*.

NEWS.

A PHYSICIANS' BUREAU OF SERVICE AND INFORMATION, TO BE OPEN TO THE PHYSICIANS AND SURGEONS OF THE WORLD.

Believing we can be of service to every practitioner of medicine who may attend the great Columbian Exposition to be held in this city in 1893, we shall establish and maintain during the entire session a bureau of service and information for the exclusive use and benefit of all visiting physicians and surgeons and their wives. Ample room will be provided for the successful operation of each department and additional space set aside for the use of the secretaries and other officers of medical societies and conventions.

No charge will be made for the services here offered, and all who are legitimately engaged in the practice of medicine or surgery will be made welcome.

The services offered are as follows:

1. Registration—By registering with us your name, college, and date of graduation, residence when at home and hotel and boarding-house while in the city, telegrams and mail matter can be promptly forwarded and correct addresses furnished to all inquiring.

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4. Postal Benefits—A miniature postoffice will be established so that mail matter may be addressed in our care.

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These privileges will be granted to physicians and surgeons (and their wives) only - college and date of graduation required on registration.

Before leaving for Chicago, the physician or surgeon who wishes to avail himself of these privileges, should instruct his bank to forward us any monies he may desire to draw through us while in our city, and leave order for all mail and telegrams to be forwarded in our care.

On arriving at the depot in this city, if he will take a cab direct to our office we will render him every assistance in our power placing him in possession of all information regarding the city, at our command.

This service, being a portion of our contribution toward making the World's Columbian Exposition the most enjoyable and instructive show the world has ever witnessed, is freely offered to physicians and surgeons with the hope of benefitting the medical profession, securing a larger attendance at the Fair, and further extending the hospitable reputation of our city.

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ORIGINAL ARTICLES.

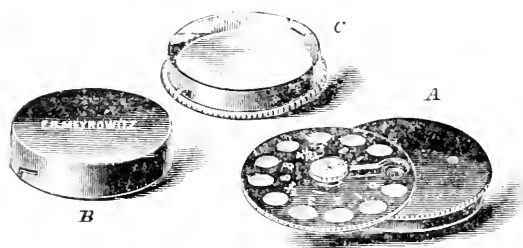
A CONVENIENT OPHTHALMOSCOPE.

BY LUCIEN HOWE, M.D., OF BUFFALO, N. Y.

So many ophthalmoscopes have been invented that it would seem unnecessary or impossible to add to the number. But as most are new only in modification of some detail, so is the one here described. It is however so much more compact than any other ophthalmoscope with which the refraction can be determined with even moderate exactness; and during the five or six years that I have carried the one which I have, the convenience proved so great, as to warrant some mention being made of it.

It is safe to say that every one who has to make examinations of the eyes carries habitually in his vest pocket a convex lens. Whether he expects to make a professional call or not, that convex lens is always in its place. When going purposely to see patients he takes with him an ophthalmoscope, but as the case is usually large, and he is so constantly aware then of having the pocket uncomfortably full, that when not actually re-

quired, the ophthalmoscope is left at home. But unfortunately it is frequently necessary to make ophthalmoscopic examinations which are unexpected, and therefore it occurred to me if an instrument could be so constructed as to be hardly more cumbersome than a convex lens, it would add to the convenience in constantly carrying it, and therefore to its efficiency. This is the object of the instrument.



The mirror (A, here represented with the face down) is about twenty-eight millimeters in diameter, of the ordinary concave form and focal distance, mounted in a ring about five millimeters wide. Behind this, there is a revolving disk containing five plus and five minus glasses, with one opening—being about such a disk as we find on the Knapp's ophthalmoscope. The only peculiarity of this disk consists in the fact that a slot extends from its center almost to the periphery, and the screw which usually holds the disk at its center, is enlarged flattened and has a bevelled edge so that it can be turned easily, with the fingers. When the ophthalmoscope is in use, this thumb screw holds the disk so that its center is near the circumference of the mirror, and the refraction lenses in revolving about the screw, come in turn behind the center of the mirror just as with the ordinary ophthalmoscope. When however it is desired to make the instrument smaller, it is only necessary to loosen that thumb screw of the disk, and sliding the disk through the slot onto the back of the mirror, it remains there, and we have simply this thickness of about a millimeter to add to the mounting of the mirror.

The convex lens (C) is mounted with a rim about 6 millimeters in width which fits over the rim of the mirror, and is held in place by a bayonet catch. Finally in order to protect the small refraction lenses it is well to have a cap (B) fit over them. This also has a thin rim about 8 millimeters wide, with a bayonet socket fitting over the rim of the lens. This cap while convenient is by no means necessary and adds to the weight. Thus the instrument is simple, compact and as useful as the ordinary refraction ophthalmoscope. When required for use the convex lens for the inverted image is removed, the screw behind the mirror loosened, and the disk, being slipped through the slot into its place the instrument is ready for use. An objection might be made that it has no handle. For a student this is possibly a slight inconvenience, but any one practiced in the use of the ophthalmoscope finds at the first trial that this one can be held before the eye with perfect ease, and the absence of the handle is not noticed even when making examinations with the upright image. The fact that the instrument has proved so very convenient and useful during a number of years, warrants, I think, this brief description of it.

TRANSLATIONS.

OBJECTIVE METHOD OF DIAGNOSIS IN PARESIS OF OCULAR MUSCLES.

BY ALLVAR GULLSTRAND, M.D.

Translated by J. B. Story, M.D., for Ophthalmic Review from the Swedish Academy.

This paper describes a purely objective method for the diagnosis of paresis of the ocular muscles. Up till now the differential diagnosis of these affections has depended almost entirely upon the subjective method based upon the character of the diplopia, and it needs no argument to demonstrate how tedious, troublesome, and uncertain this method is in many cases, and how impossible to satisfactorily work with in some.

Gullstrand's method consists in a systematic comparison of the corneal reflections, as seen in the pupils when the eyes are rotated in the various meridians of the fields of fixation. The corneal reflection above is the same object as has been used by different observers in estimating the amount of strabismus (*vide* Priestley Smith's paper, O. R., Vol. VII., p. 349). The author devotes considerable space to showing that the relative position of these two objects, the corneal reflex and the pupil respectively, is a sound and satisfactory test of the movements of the eyeballs. It is well known that a corneal reflex changes its position in the pupil when the eye moves, and the reason that it does so is that the two objects, reflex and pupil, lie at different levels in the eyeball. If we assume that the corneal reflex lies on the line joining the eye observing and the eye

observed, it must be on the line drawn from the observing eye to the centre of curvature of the observed cornea; so that we may assert, as a general principle, that when the reflex lies on the observer's visual line, the position of the visible corneal reflex in movements of the observed eye coincides with the centre of its corneal curvature. By which is meant not that the reflex actually lies at that point, but that its apparent position alters in movements of the globe as if it were situated at that point. This general principle, however, can only be applied to the reflex from the portion of the cornea near its centre, as it is only in that region that its curvature approximates closely enough to that of a sphere.

The object whose position is compared with that of the corneal reflex is the centre of the pupil, which, owing to the refraction of the aqueous and cornea, appears to lie about 3.26 mm. behind the cornea. This is strictly true only, when the line, which passes through the centre of the pupil, coincides with the observer's visual line, as spherical aberration affects the calculation in other positions. We have then two objects to compare: the corneal reflex, whose apparent position is at the centre of the corneal curvature, or 7.8 mm. behind the cornea; and the centre of the pupil, which is 3.26 mm. behind the cornea, or about 4.5 mm. in front of the former.

It may therefore be laid down that when the corneal reflex lies on the observer's visual line, its position in a small-sized pupil changes on movement of the observed eye as if the pupil had made an equal angular movement round the corneal reflex as centre at a distance of 4.5 mm. as radius. If the movement of the eye is defective in any given direction (paresis or paralysis), the reflex does not change its position in the pupil as it does in a normally-moving eye, and it appears displaced toward the side of the defect—viz., toward the affected muscle—just as the false image in diplopia is displaced. This displacement affords an objective test of paralysis of a muscle, which supplements, or rather renders unnecessary, the usual subjective test of diplopia.

Two objections may be raised: firstly, that the method is

not sufficiently delicate to detect small defects in ocular movements, those, in fact, which produce the most distressing diplopia; and, secondly, that it cannot help in those cases where the oblique position of the double images is a material point in forming a diagnosis. As regards the latter objection, Gullstrand asserts that the obliquity of the double images is not a necessary observation in the diagnosis of uncomplicated cases, as the diagnosis can be made easily without regarding it, and in presence of the least complication the obliquity fails to afford the information we desire. It cannot be observed sometimes in cases where it should be manifest, and it is present in others where it should be absent—for instance, in paralysis of the external rectus.

In testing by the objective method, we must not restrict ourselves to observations of defective movements, starting from the primary position only. As the objective method takes no account of rotations of the globe round the optic axis, it is necessary to place the eye in such a position that the superior and inferior recti and the obliques can only act as elevators or depressors of the corneal centre. This is, of course, effected by abduction and adduction respectively. In abduction the superior and inferior recti can only elevate or depress the corneal centre, and in adduction the obliques perform this office.

It is always best to have the observer's eye, the luminous object, and the patient's fixation-point stationary, and let the movements be affected by rotation of the patient's head. A window can be used as luminous object, or a white card with a central perforation, as in keratoscopy, or a laryngoscopic mirror (the ophthalmoscopic mirrors are not large enough to produce a reflex image on both corneæ at once), but the two eyes (observed and observing), the fixation-point, and the source of light should, so far as possible, be in the same straight line.

Gullstrand prefers the window as object for reflection, and proceeds as follows: The patient is placed so far from the window that the corneal image is seen within a moderately

contracted pupil. The observer first determines the presence of binocular fixation, and then alters his position until the reflexes are seen symmetrically in the two pupils. The absence of binocular fixation may at once enable the diagnosis to be made, but further examination is always desirable, and often absolutely necessary. Usually four movements are sufficient, bending forward and backward, and turning the head to the right and to the left; but if the case is complicated, the diagonal positions must also be investigated. Although it seems hardly necessary in an ophthalmic periodical, it may be well to produce Gullstrand's complete list of defective movements and their respective causes.

A. Horizontal asymmetry, on looking to the right shows lesion of a muscle turning the eyes to the right.

1. The reflex in right pupil deflected to the right (or in the left to the left) shows lesion of right external rectus (or weakness of the muscle in fixation with right eye, and secondary deviation of the left eye).

2. The reflex in the left pupil deflected to the right (or in the right to the left) shows lesion of left internal rectus (or weakness of that muscle in fixation with the left eye, and secondary deviation of right eye).

B. Horizontal asymmetry, on looking to the left shows lesion of a muscle turning the eyes to the left.

1. The reflex in left pupil deflected to the left (or in right to the right) shows paresis of left external rectus (or weakness of that muscle in fixation with left eye, and secondary deviation of right eye).

2. The reflex in right pupil deflected to the left (or in the left to the right) shows lesion of right internal rectus (or weakness of that muscle in fixation with right eye, and secondary deviation of left eye).

C. Vertical asymmetry, on looking upward shows lesion of some one of the elevating muscles.

1. The reflex is higher in right pupil.

a. Looking to the right side shows lesion of right superior rectus.

- b.* Looking to the left shows lesion of right inferior oblique.
- 2. The reflex is higher in left pupil.
 - a.* Looking to the left shows lesion of left superior rectus.
 - b.* Looking to the right shows lesion of left inferior oblique.
- D.* Vertical asymmetry, on looking downward, shows lesion of a depressor muscle.
 - 1. Reflex lower in right pupil.
 - a.* Looking to the right shows lesion of right inferior rectus.
 - b.* Looking to the left shows lesion of right superior oblique.
 - 2. The reflex is lower in left pupil.
 - a.* Looking to the left shows lesion of left inferior rectus.
 - b.* Looking to the right shows lesion of left superior oblique.

This simple test is sufficient to differentiate paralysis of any one single muscle, and even more complicated lesions—for instance, if two associated lateral muscles are affected, the reflex will be deflected toward the affected side in both pupils in movements in that direction. Again, as symptoms of lesions in lateral muscles are only present in horizontal movements and of elevators or depressors in vertical movements, the lesions of one group can be distinguished from those of the other, even when both groups are affected.

It is only when, by complete paralysis of one lateral muscle, movement in that direction is absolutely impossible, that difficulty is experienced. But suppose, with complete paralysis of the right external rectus, an elevator is also paralyzed on that side. If the vertical deflection of the reflex is seen on looking to the left, the inferior oblique must be the muscle affected; if it is not seen, then the superior rectus is affected. If both lateral muscles of the eye are completely paralyzed, the lesion of an elevator will deflect the reflex either upward and inward, or upward and outward. In the first case the affected muscle is the superior rectus, in the second the inferior oblique.

Certain combinations of elevator and depressor lesions necessitate testing in the diagonal positions. Suppose horizontal movement normal, and reflex in right pupil deflected upward on looking upward, and downward on looking downward. Then there is a lesion of both an elevator and a depressor, and

the muscles are antagonists—either the two recti or the two obliques. If the deflection exists on looking to the right, and then raising or lowering the eyes, the recti are affected—if, on the contrary, it shows itself on looking to the left and raising or lowering the eyes, the obliques are affected.

Further still more complicated cases are discussed with a view to showing the utility of the objective test.

One marked advantage of the method is that its results can be shown photographically, and Gullstrand's paper concludes with twenty-nine excellent photolithographs of actual cases, of which he gives a detailed description in the text. The plates are quite sufficient vindication of the method against the first of the two objections mentioned above.

SELECTIONS.

EYE-STRAIN AND ITS RELATIONS TO "CEREBRAL HYPERÆMIA," ETC.¹

BY E. C. SEGUIN, M.D.

Eye-strain, more especially that due to paresis or original weakness of the third and sixth cerebral nerves, produces many symptoms besides cephalalgia and migraine which have lately received so much intelligent attention. The symptoms to which I refer are fully as important as cephalalgia and migraine, but have been generally, if not universally, misunderstood because practitioners have blindly followed the theoretical teachings of certain authorities.

The chief of these symptoms are: Occipital, suboccipital, and occipito-cervical pain and distress; a sense of stiffness in the occipito-cervical region ("at the base of the brain," as is commonly said); feelings of fullness, pressure, or lightness in the head; sensations of numbness or of formication in the scalp; varying degrees and forms of dizziness (but not true vertigo²); inability to read, write, sew, converse, sit at table, to go on the street or into rooms, and even to "think," without supervention or aggravation of symptoms; fear of certain

¹A supplement to Lectures on some Points in the Treatment and Management of Neuroses, which appeared in the *Journal* in April and May, 1890. Lecture I. Written at Florence in January, 1890, for a German edition of the Lectures (G. Thieme, Leipsic, 1892)

²Aural or labyrinthine vertigo and vertigo from evilent or latent diplopia are, of course, excluded. In such cases true vertigo (subjective whirling or turning) exists, and often no other cerebral symptoms are present.

places; insomnia; emotional attacks; pains (differing from migraine) in various parts of the head; and, later, also the multiple symptoms termed neurasthenia. Individual patients describe these subjective symptoms somewhat differently, according to their ability of observation and their facility of expression.

The above-mentioned symptoms, variously grouped and sometimes combined with others, have been appropriated by the advocates of a fanciful vaso-motor pathology; and such wholly theoretical "diseases" as "*cerebral hyperemia*" (Hammond) and "*congestion of the base of the brain*" (Brown-Séquard) have been accepted by the profession with but too little open criticism, and multitudes of patients have been treated by remedies *deductively* considered as useful, such as the actual cautery, cups, and blisters to the neck, the ice-bag to the head and spine; internally, ergot, the bromides in full doses, belladonna, and (contrary to the theory, but found useful in practice) strychnine. Such cases have never been cured, I believe, by these means alone, though often relief has been obtained by the analgesic effects of the remedies and by the *suggestion* of the confident specialist.

I have never recognized these so-called "diseases," but have always recorded and spoken of the symptoms as paræsthesiæ of the head (*cephalic paræsthesiæ*), awaiting the time when experience might lead to their more correct interpretation.

To be brief, I now believe that I can offer a preliminary partial grouping of these symptoms according to their pathogenesis, not by any means a perfect scheme, but one which may serve as a basis for further and more minute observation and better classification.

1. The majority of cases presenting such symptoms are, I think, cases of eye-strain: exhaustion and hyperæsthesia resulting from the persistent use of weak neuro-muscular organs, more especially the third and sixth nerve apparatuses. Errors of refraction seem to play but a secondary part in the genesis of the symptoms, whereas they are very important in cases of cephalalgia and migraine. Most of all, suboccipital pain and

distress (the chief symptoms of "congestion of the base of the brain") are due to defective power of convergence and accommodation. Not rarely, in all categories, the symptoms appear within a short time or suddenly, after years of apparently easy use of the eyes. This sudden onset may often be traced to the action of some debilitating influence, such as an attack of acute disease, to over-use of the eyes, etc.; and it often coincides with the "failure of accommodation," normal or premature. In other words, the strain and fatigue resulting from the use of weak eyes are often long compensated or rendered latent by perfect health.

2. Some cases (my experience does not enable me to state a proportion) of cephalic paræsthesiæ are due to dyscrasic conditions, more especially lithæmia, oxaluria, latent gout—in general tones, to conditions of suboxidation. The early stage of cirrhosis of the kidneys is sometimes characterized by these symptoms and obstinate headache, and in these cases the arterial tension is persistently high, the urine is overabundant, of low gravity, contains hyaline casts with or without albumin; attacks of convulsions and of slight hemiplegia are not rare.

3. Such symptoms as lightness in the head, pressure in any direction (I do not believe that the *direction* of the pressure, a purely subjective interpretation by the patient, has any meaning in the present state of our knowledge), and deficiency in power of attention, memory, etc., may undoubtedly be caused by anæmia of the brain from general anæmia or through valvular cardiac disease, feeble heart, etc.

4. It is also possible that occasionally these symptoms indicate the beginning of organic cerebral disease, but at present we can not feel sure of this in a given case.

5. Probably cephalic paræsthesiæ are developed by the action of peripheral—*i. e.*, extra-cerebral—lesions, as in some cases of "spinal irritation," etc.

The chief purpose of this note is, however, to endeavor to advance the problem, as presented in group 1, one step further, and to state (from observed facts only), which of the above-mentioned symptoms may be caused by paresis of the third

nerves and their muscles, and which by paresis of the sixth nerves and their muscles, apart from the element of refraction, which is also important.

The necessity of stating my views in so small a compass must be the excuse for the following condensed summary of two symptom groups which deserve ample treatment:

A. Symptoms of Paresis (Insufficiency) of the Third Cerebral Nerves and Attached Muscles.—Occipito-cervical pain and "distress" are the characteristic symptoms, sometimes the only ones. The pain, diurnal as a rule, and often not appearing until the patient has used his eyes in dressing, eating, or reading, is usually greatest between the occipital bone and the second vertebra, though it often extends from the upper part of the occiput to the fourth or even the sixth vertebra. It is sometimes more a "distress" than a true pain, and is often accompanied by sensations of stiffness and tightness ("as if a hand grasped the neck"). There is never, strictly speaking, neuralgia of the occipital nerves, or objective rigidity as in beginning caries. Tenderness is rarely found, though in women spinal hyperæsthesia (so-called spinal irritation) often coincides. Frequently there is a sensation of weight or downward pressure on the back part of the head, with (usually) intermittent numbness (a "dead" or "wooden" feeling) and formication. In some cases the fullness or tightness (cincture or cap feeling) extends to the whole head.

Apparent loss of power of attention and concentration (volition) is much complained of, even to a degree simulating mental failure.³ Reading, writing, sewing, piano practice, conversation, even eating, are painful or unbearable; in other words, the symptoms are increased by an act requiring convergence and accommodation. It is sometimes said by patients, in objection to the suggestion of eye-strain, that the symptoms appear or are increased by "simply thinking"; but this statement involves ignorance of the psychological fact (or

³Some cases of "breaking down" at school from "overwork" belong to this category.

law) that in thinking, giving attention, concentrating our mind, and in willing—in all such apparently purely psych'ic acts—we unconsciously send out motor impulses to the ocular apparatus chiefly, but also to many other muscular groups. Any one can, by a few moments' study of himself, verify the truth of this statement that giving attention or willing usually includes external muscular activity (unconsciousness, as a rule). Thus eye-strain occurs in persons who do not mean to use their defective eyes.

The prolonged duration of these symptoms, or rather of the strain, may lead to neurasthenia, insomnia, and a curious mixture of hysteria and hypochondria, so that the diagnosis becomes more obscure.

Headache is not rare, but in such cases there are also usually faults in refraction or other factors. Simple asthenopia, sense of fatigue, or pain in the eyes, orbits, brow, or temples, is only occasional, and seldom a prominent symptom. Usually the patient pretends to have strong eyes.

B. Symptoms of Paresis (Insufficiency) of the Sixth Cerebral Nerves and Attacked Muscles.—In contrast with the symptoms of insufficiency of the third nerve apparatus, the symptoms of this condition are diffused, variable, and less definite. Perhaps the most prominent is dizziness, or "vertigo," as stated by the patient. But close questioning shows that this is not a true vertigo, but a sense of unsteadiness, of uncertainty of equilibrium, of confusion, clearly referred to the head. Allied to this is nearly always a sense of indefinite fear. At times the dizziness is so great as to oblige the patient to keep his room and to give up all ordinary duties and relations. Going out upon the street or entering rooms filled with people intensifies the feeling to an insupportable degree, and the patient needs the moral or physical support of another person.

Various and peculiar sensations are felt in the head—such as a sense of fullness, "as if the head would burst"; a downward pressure on the head, diffused or localized, "as if a stone or a sharp stick" passed on it; a sense of constriction, general or cincture-like; pain in various areas of the scalp; occasional

feelings of numbness (a "dead" or "wooden" feeling), or of formication or wormlike crawling, also various'y distributed; a quasi tinnitus or noise in the head (not in the ears) is not rare.

As these paræsthesiæ are increased by the sight of moving objects in a small or large space (on the street, where machinery is in motion, or where a number of people are moving), we often meet with conditions like those termed agoraphobia and claustrophobia; and I am confident that many cases recorded under these titles have really been cases of eye-strain. However, I admit that there are such cases which depend upon more general pathological conditions. I should add that the movements necessary to make the examination of the eyes of these patients fatigue them very much, even the simplest test of the recti muscles by the index finger causing distress. Hence examinations should be made slowly and in several *séances*.

Apparent loss of mental power is perhaps more marked a feature of these cases than of those of category *A*. The patient can do things fairly well all alone in the quietude of his room, but in his relations with the world he seems to lose all self-control and power of attention and concentration. In consequence of the distress attending going out upon the street and meeting other persons, such a degree of emotional disturbance (loss of self-control) is developed that the patient is said to be hysterical. His symptoms absorb his attention so much that he often is called hypochondriacal as well.

Insomnia and neurasthenia are results of long-continued eye-strain in this category as in the first—perhaps more. It is in these later stages of the affection that the diagnosis becomes obscure, and can only be determined by prolonged observation and by trial of treatment. For it is not easy to say at once, in a case presenting symptoms of neurasthenia and hysteria (perhaps also "spinal irritation"), together with defective eyes, which of the conditions is primary and pathogenetic. The relation of cause and effect is doubtless in either direction in different cases, and it will be for future observation to give us the

elements for judging this important question more quickly and positively.

In the few cases which I have seen in which all the ocular muscles were parietic, the (multiple) symptoms were more like those of category *B*.

It may be said that there is a certain overlapping of semeiology in this sketch of the two symptom groups. This is true, but I believe that further study will make the distinction more complete, though it must be remembered that these overlappings appear in nearly all symptom groups which we attempt to represent as "diseases." This note is suggestive only, and I do not pretend to state more than the main outlines of the question.

It is probable that a special grouping of symptoms will be found to be due to "spasm of accommodation," which so often complicates errors of refraction. I have not the data for any suggestion in this direction, except to say that headache and migraine will be found prominent.

Diagnosis by Manipulation.—It is out of my province to speak of the ophthalmic examination necessary in all such cases; but I desire to call attention to the facts that the simple test of convergence, by approximating a small object to the patient's nose, increases the suffering of subjects of the first category, while those of the second category experience great distress when made to look outward or around without moving the head, or if a bright object is moved circularly, or a wheel rotated before them. Complete atropinization gives these last patients great relief.

Diagnosis by Drugs.—In the present state of medicine this is occasionally a final resort. We employ it in supposed malarious and syphilitic cases, even while remembering that quinine does cure some non malarious conditions, and that mercury and iodide of potassium are occasionally efficacious where syphilis is out of the question. A trial by bromide treatment often enables us to correctly judge cases in which hysterical and epileptic symptoms are conjoined. In cases of eye-strain, experience has taught me that cases of the first

category (third-nerve paresis) are relieved by nux vomica or strychnine, and are aggravated by belladonna and other mydriatics; whereas, on the contrary, the last-named remedies give relief to cases of the second category (sixth-nerve paresis), and strychnine makes them worse. In some uncomplicated cases of paresis of the third nerves (insufficiency of the recti interni or of the ciliary muscle) an apparent cure is obtained by a progressive course of strychnine.

I cannot in this note refer *in extenso* to the treatment of all such cases, but will simply repeat what is stated in the text of the *Lectures*—viz., that, apart from the adaptation of proper glasses and prisms, in some cases the use of partial or total tenotomy or myotomy, which are all of the utmost importance, the scientific treatment consists in the internal use of nux vomica, strychnine, and nerve tonics generally in cases of category *A*, and of cannabis Indica, belladonna, atropine, conium, the bromides, antipyrine, etc., for cases of category *B*. Of course, in cases of both categories, rest, much more complete than is usually prescribed (even ocular rest by prolonged atropinization), and a general restorative treatment are necessary. Change of scene and travel are useful, but should never be prescribed until all the visual defects have been corrected and convalescence is evident. Work should not be resumed except with the aid of the most appropriate optical correction, and by degrees. It must be added that there are eyes which can not be "corrected" with our present appliances, and in such cases the prognosis is bad, although temporary improvement may be obtained by proper medicinal and hygienic treatment. I would, lastly, suggest that tobacco is particularly injurious to persons whose third nerves are weak.—*New York Medical Journal*.

PLICA CIRCULARIS CONJUNCTIVÆ IN THE NEGRO.

BY MIDDLETON MICHEL, M. D.,

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State of South Carolina, at Charleston, S. C.

Many years ago I noticed a singular distribution of the ocular conjunctiva in a negro child, and, having found the same condition in other children of the same race on several subsequent occasions, I was led to make some comments on the subject at a meeting of our medical society some time in 1880.

I had met this peculiarity only in negro children, except once in an adult negro whose eyes were so from childhood. At that time, as now, I thought that this was an anatomic arrangement of the conjunctiva more frequent, perhaps, in the negro, as I have not seen it in the white race, although I supposed it occurred in the latter, since Desmarres describes a somewhat similar condition witnessed on more than one occasion at his clinics in Paris. Desmarres proved to be the only author among the many then consulted who referred to anything of the kind, and he regarded it as a perikeratitic hypertrophy of the conjunctiva.¹

Further inquiry among authorities at hand revealed the existence of a very rare disease of the eyes during spring and summer months, which had but recently attracted the attention of European oculists, some of whom regarded it as a veritable spring catarrh.

Hunter appears to have been the first to give a full and accurate account of this disease, in 1879; though Arlt² seems to have noticed it earlier and to have written concerning it in 1851.

Subsequently an interesting description of this complaint is recorded by Dr. Swan M. Burnett, who refers particularly to its occurrence among negroes. All of these and other writers, however, speak of a disease of the eyes not limited to any one part of the mucous membrane, but invading all portions of the conjunctiva of either one or both eyes, and especially conspicuous in the palpebral part of its course, characterized by nodules, excrescences, or papillary elevations of variable size. Such importance, indeed, is attached to the blepharitic condition that some have considered this the pathognomonic symptom, differentiating the disease from trachoma by the flatness and other features of these granulations.¹ All refer to a disease. Arlt indorses this view and considers it a scrofulous conjunctivitis that manifests itself especially among children between the ages of ten and fifteen years; but he remarks that it makes its appearance without previous inflammation, and so far resembles a simple hypertrophy in parts of the mucous membrane about the cornea; that his early acquaintance with the affection was in a little patient sent him by a colleague with the request that he would operate upon the eyes supposed to be affected with pterygia. Burnett writes also of a "circumcorneal hypertrophy of the conjunctiva," giving the same appellation as Desmarres, but stating that everything warrants the affection to be classed among the "conjunctivitides."

Personal research, on the contrary, and consideration of the rare instances that have come under my observation since 1876, force me to announce in this paper a congenital not an acquired or pathologic state of the adnata; having nothing to do with vernal conjunctivitis—*conjunctivite printanière* of De Wecker—or spring catarrh of the conjunctiva.

In my experience these accidental occurrences came in both eyes of negro children, at distant intervals, without reference to seasons of the year, and were of such a nature as to arrest my attention at once as something with which I was unacquainted. The impression at first conveyed was that of a singular development of perfectly symmetrical pterygia, of a dark color, surrounding both corneæ, giving a striking appearance and con-

veying an indiscrivable expression to the child. No pain, no iritic or sc'ero-corneal vascularity, no lachrymation, nothing indicative of inflammation was present; there was some little irritation, perhaps, but not more than would be produced by the friction of any thickened pterygium with the periodic movements of the lids.

Closer inspection discovered both corneæ buried within a rim-like encasement, produced by the infolding of the conjunctiva symmetrically around their margins to the distance of about an eighth of an inch, the accurately defined limitations of which were better marked by a deep pigmentation of the reduplicated conjunctival fold, such a coloration as is not uncommon about this membrane in negroes, but which was here confined to this plica circularis alone. This marginal hem of conjunctival tissue seemed borrowed in part from the bulbar portion, though principally made up of the attenuated sclero-corneal or almost epithelial portion; and this fold, quite detached and easily raised with a probe all around the cornea, was slightly elevated by an exudation through its layers so as to assume a gelatinous appearance. No trace of ulceration or phlyctenulæ could be discovered, and no leashes of blood-vessel were visible anywhere running into this mucous zone. The curious fact that Graefe¹ has written of what he terms a "gallertige infiltration," that is a jelly-like infiltration about the limbus, convinces me that so high an authority also noticed this peculiarity which he, I believe, never associated, any more than did Desmarres, with any particular disease.

With the exception, then, of Desmarres, Graefe, perhaps Arlt, and recently Bronner,² who respectively refer to a strange adjustment of the adnata at the corneal attachment, and to its hypertrophied aspect, the only approach which others make toward the recognition of a similar distribution of the conjunctiva herein described among negroes is the mention of a partial thickening that sometimes results from a periodic summer disease of a markedly scrofulous and catarrhal type occurring and disappearing with the disease, but which does not by any means invariably include the entire circumference of the cornea.

Emphasis should be placed upon this special circumferential fold, as this feature is obviously more or less conspicuous in the accounts given by the few authorities recognizing this phase of the subject. The perfect symmetry of this overlapping fold of equal width around the cornea of both eyes appears to me inconsistent with the idea of its origin from previous inflammation, ulceration, or disease of this membrane. The history of the formation of a pterygium and of the degenerative changes consequent upon attacks of recurring conjunctivitis call to mind the irregular and eccentric folds into which the mucous membrane is thrown and puckered under such circumstances. After abrasions or even slight loss of epithelium about the region of the limbus, the swollen conjunctiva reaches the denuded surfaces, becomes agglutinated, and finally adherent, cicatricial contractions establishing a tucked fold of greater or less peripheral extent about the cornea with such vascularity as to indicate its traumatic origin; the radiating lines of traction toward the corneal attachment imparting the characteristic triangular shape to the pterygium, which, from the very nature of the tissues implicated, rarely occupies more than a very limited portion of the limbus, but never travels entirely around the bordered region in one symmetrical, regular, continuous fold of perfectly healthy tissue of the same width throughout.

Herpetic or phlyctenular ulcerations, and particularly multiple syphilitic gummata, with their nodules running confluent one into another in a thickened border line about the cornea, might easily impose a similar aspect, but the immobility of indurated, cicatricial, and adherent tissue, with well-marked traces of previous disease, are always present to exclude any misapprehension.

Regarded by some again as a simple hypertrophy of the membrane—the view which Desmarres evidently takes of the subject—it may be inquired whether this condition was considered as the result of previous inflammations or not. Now, hypertrophy of a mucous membrane consists of an increase of its structural elements, the nutritive material for which is imported into the region by a liberal blood-supply; but just here

in this locality the conjunctiva has parted with all or its histologic elements save its protective or epithelial layer, which remains alone to extend itself like the thinnest possible araneous structure over the cornea. Any hypertrophy about the limbus could consist of a hypertrophy of epithelia only, and, however great this epithelial proliferation might be, it would scarcely constitute the increased thickness, and anatomic folding-in of the layers such as has been described, and certainly would not be regarded as a true hypertrophy of the mucous tissue as such; nor would this be productive of exactly the appearances we have noticed. It must be remembered in this connection, however, that hypertrophy may sometimes be congenital.

The striking pigmentation of this ring of movable and overlapping conjunctival tissue, in bold contrast with a clear and non-vascular ocular conjunctiva in the negro, formed another remarkable feature of these cases. Here again, in this vicinity we are not to look for a veritable secretion as we would elsewhere, for no secretory process is possible where the histologic structures, even as simple cells, are not present to produce it; this coloration seems rather to depend upon certain filtrates from the blood, escaping without rupture of any bloodvessels, but through simple pressure consequent upon the obstructed or impeded flow through this modification of the mucous membrane; the dark pigmentation represents such chemical changes as have readily converted these filtrates into pigments; through mechanical obstructions the hemoglobin escapes, permeates the part, and becomes converted into permanent pigment.

To the views herein expressed as to the anatomic nature and congenital character of this circumcorneal ring of mucous membrane the only avenue to adverse criticism would lie in the conjecture that I had overlooked a very important disease of the eye, designated by some writers as conjunctivitis æstivalis, or more likely that I have only seen a singular chronic variety of the affection supposed to have exhausted itself at the limbus alone. Would not, however, the annual recurrence of such a disease have very soon declared itself in unmistakable terms?—or even its occasional advent have rectified any possible or

probable misconception? Especially would this have been the case, as during the prevalence of the recent allotropic conditions of the oxygen of the air that have predisposed to every kind of irritation and inflammation of the sensorial and respiratory tracts, we have all been vigilant of any epidemic or endemic cause engendering disease. Again, would not the palpebral variety of the disease, so dwelt upon by those who have accurately described it, have unavoidably intruded itself upon my observation, more particularly from its supposed resemblance to *trachoma*, which latter affection is so rare in negroes that many consider this race as almost exempted.

The absence, then, of all catarrhal symptoms, and the exceptional peculiarity of so precise and equable a perikeratitic fold of highly pigmented movable membrane, presenting a like arrangement in both eyes, and seen in negroes alone, are circumstances that seem to indicate a congenital disposition of the conjunctiva, very frequent, at least, in the negro, and similar to the *plica semilunaris* and *membrana nictitans*, of which the former is but a vestige.

Until further developments respecting this subject I am disposed to consider this a description of an anatomic feature observed in the eyes of our negro population particularly, which should be termed the *plica circularis*.—*Med. Notes.*

THE TREATMENT OF HYPOPYON KERATITIS.

BY G. E. DE SCHWEINITZ, M.D.

The term purulent keratitis describes in a general way the forms of inflammation of the cornea associated with the development of pus, either within the layers of the cornea or in the anterior chamber. It is typified by the disease which has been variously called abscess of the cornea, hypopyon keratitis, and serpiginous or creeping ulcer. The serious nature of the affection, the scarring of the cornea which practically always follows it, the disfiguring staphylomatous protrusion which may ensue, and the actual blindness which is only too frequently the result of it, furnish sufficient reasons for the most attentive treatment, and if any new method, or new method of applying old measures, gives evidence of producing better results than those which have been previously employed, we necessarily turn to it. For this reason the paper of Fukala (*Berliner Klinische Wochenschrift*, December 5, 1892), entitled "A New Method of Treating Abscess of the Cornea," is worthy of review.

Two evident indications for the treatment of abscess of the cornea are to prevent the bulging of this structure at the point of the lesion and to evacuate the pus, either for the layers of the cornea or from the anterior chamber, or from both places. The tendency to protrusion of the affected tissue is brought about partly by the fact that the walls no longer resist the intraocular tension so well as they did before they were attacked with the disease, and partly by the fact that the pus burrows, or at least spreads, in the lamellæ of the cornea and lifts them from the surrounding more healthy tissue, very much as the same process takes place in an abscess in the subcutaneous

tissue where the gradual accumulation of pus and its infiltration along the lines of least resistance raise the superficial tissues above their surrounding level. With these two indications in view, and influenced by the facts which have just been recited, Fukala believes that the treatment of hypopyon keratitis, or, as he calls it, abscess of the cornea, should consist in methods which are calculated to change the entire abscess into an open ulceration, to which the stimulus to cicatrization has been given.

This he accomplishes in the following manner: The conjunctival cul-de-sac is carefully irrigated with a 1 to 5000 sublimate solution, after the eye has been rendered anæsthetic with a few drops of a five per cent solution of hydrochlorate of cocaine. The superficial portion of the lesion is seized with a pair of fine forceps (iris forceps), and removed by means of the iris scissors. Very often the forceps are unnecessary, the scissors being all-sufficient. The important point is that all of the necrotic tissue shall be removed to the extreme periphery of the lesion in its entire circumference. Afterward the open wound is sprinkled with the sublimate lotion, atropine is instilled, and a pressure bandage is applied. The open wound which results from this procedure, according to the author, is speedily cicatrized by the process of granulation. In the cases which are quoted in support of this, two in number, the result appears to have been prompt and satisfactory.

It is difficult to understand why the author of this paper refers to the method which he employs as a new one, as the removal of necrotic tissue from a sloughing ulcer of the cornea by some means or other, although perhaps not necessarily with an iris forceps and iris scissors, is a very well recognized surgical procedure. It serves, however, as an introduction to what are the best means of treating these serious forms of corneal ulceration. Saemisch's section, once so popular and, when successfully performed, capable of yielding the very best results, has not found in recent times the favor which it once enjoyed, largely, perhaps, because other methods—for example, the actual cautery—have secured equally good results.

and have been unattended with many of the dangers which encompass it, chief among which is prolapse of the iris into the lips of the wound. It would be useless to urge at this late date the claims of the actual cautery in the treatment of infective corneal ulceration. These are so well established as to require no further commendation; and Fukala, impressed with the value of his own method of treating this disease, brings forward as its chief endorsement that in his hands it has yielded as good results as has the actual cautery.

There are, however, cases in which a very large ulcer is associated with a hypopyon that nearly fills the anterior chamber, and in which it can be demonstrated that the collection is exceedingly tenacious, having assumed the character of a slough. Under these circumstances there is a strong indication for Sæmisch's section, or, at least, for a section which in some way makes it possible to reach the material in the anterior chamber with forceps, or to afford a point of entrance for the tip of a delicate syringe, with which the anterior chamber may be irrigated. As Gruening long ago pointed out, it is not unlikely that in those cases a combination of Sæmisch's section and the actual cautery is preferable, because the latter destroys the septic material of the cornea and the former removes septic material from the anterior chamber.

The comparative value of incision and the galvano-cautery, as given in a table compiled by Nieden, is as follows: In 113 cases of incision there were 9.7 per cent of phthisis bulbi, 26.5 per cent of leucoma adhærens, 61 per cent of macula, and 3.5 per cent with unknown result; while in 100 cases treated with the galvano-cautery there were 0 per cent of phthisis, 3 per cent of adherent leucoma, 9 per cent of leucoma, and 88 per cent of macula. It is, however, very difficult to obtain accurate comparative statistics on this point, and the treatment of each case must be governed by the existing conditions and cannot be decided on statistical information.

So far as Fukala's recommendation to remove the necrotic tissue and to convert the abscess into an open ulcer is concerned, it may be said that, independently of the fact that this

method, or one analogous to it, is well known and often practiced, there is reason to fear that the resulting scar may be more extensive than that which is caused by some other procedures. One of the objections urged against the galvano-cautery is the fear that it may lead to a very firm and extensive cicatrix. This objection does not seem to be well founded, and as Fuchs has stated, and as it has often been shown since, the opacity is not greater after the actual cautery has been used, it is applied properly and only within the area of necrotic tissue, than if it had not been used. The small circumscribed abscesses of the cornea, which really, by virtue of the fact that the superficial epithelium has not broken, belong rather to the non-ulcerated lesions of the cornea, are very well treated by cutting with a delicate knife the superficial layers, and thus evacuating the pus, as is especially urged in a paper by Hansell; or, after incision of the superficial layers, the necrotic tissue may be touched with the point of a galvano-cautery or scraped away with a small curette, converting them, as Fukala would do with the larger ones, into an open ulcer.

After the ulcer has been thoroughly broken down by scraping its margins, the surface may be cauterized with a two per cent solution of nitrate of silver, which, in the opinion of many surgeons,—Berry, for instance,—is quite as efficacious as any other method. Fukala, after his operation, recommends sprinkling the surface of the ulcer with sublimate lotion; no doubt a very excellent precaution, and one tending to stimulate healing; but, on the whole, iodoform is the preferable drug. It is well borne by the cornea, has a distinct anæsthetic action, and in corneal tissue probably encourages the healing by granulation. The iodoform treatment alone, however, is hardly sufficient, and although the drug holds a justly high place in the treatment of corneal ulceration of the sloughing type, it has a good many failures to its credit, and statistics show that from six to seven per cent of shrunken eyeballs have resulted from depending alone upon the iodoform treatment of infective corneal ulcers.

It should not be forgotten that many of the cases of moder-

ate hypopyon keratitis do remarkably well without operative interference. Atropine or eserine, according to the indications, hot compresses, a compressing bandage, and irrigation of the lachrymal sac constitute measures which have yielded abundant success; in fact, one of the chief difficulties of telling exactly what is the most valuable form of treatment in any one particular type of corneal ulceration is, that it is so rare to employ the various measures unassociated; thus, the author whom we have several times quoted, practicing the very rational and quite common procedure of removing the necrotic tissue in order to convert the slough into an open and healthy sore, follows his treatment by sublimate lotion, atropine, and a compressing bandage, and is rejoiced to find, in one instance least, the disappearance of a small hypopyon in the course of twenty-four hours, a result which might have ensued without the operative interference. This combining of methods of treatment has been one of the chief difficulties in exactly determining the value of eserine in corneal ulceration. The miotic has been used with very good results, and in recent times it has seemed with better results than those obtained from mydriatics, but it has almost always been employed in association with other methods of treatment: hot compresses, bandages, antiseptic fluids, bracing constitutional treatment, and rest in bed.

The summary of the matter, so far as surgical procedures are concerned, would seem to be somewhat as follows: The actual cautery in medium-sized septic ulcers of the cornea with moderate degrees of hypopyon; Sæmisch's section, or a modification of this, in large infective ulcers with extensive hypopyon, composed of tenacious material resembling a slough; a combination of the galvano-cautery and corneal section in types of extensive ulceration and tenacious hypopyon, where there has been a particular tendency for the ulcer to spread and to resist treatment; some form of operation which removes the necrotic tissue in circumscribed abscesses of the cornea, or in small abscesses which have burst superficially and are beginning to infiltrate the lamellæ of the cor-

nea; and, finally, in any form of infective ulcer of the cornea, after removal of sloughing tissue by any of the recognized means, the direct application to the lesion of an antiseptic, and experience seems to show that iodoform is the one most generally applicable. In all of the instances quoted, if there is no contraindication, the compressing bandage assists in the cure, and, indeed, very likely is responsible for a great deal of it.—*Therapeutic Gazette.*

REVIEWS.

TEXT-BOOK OF OPHTHALMOLOGY. By Ernest Fuchs. Authorized Translation from the Second Enlarged and Improved German Edition by A. Duane, M.D. New York: Appleton & Co. 1892.

The American profession decidedly owes Dr. Duane sincere thanks for having translated the most excellent text-book of Fuchs, and having done it in such a perfect manner. As long as there are possibilities of doubt left, there will be two or more opinions about a given point and we can therefore expect in reading any such book to find opinions with which we differ. Such points are, however, few and far between in the text-book before us. Its clearness and preciseness of language is not its least recommendation.

ON THE PATHOLOGY AND TREATMENT OF GLAUCOMA. By Priestley Smith. With Sixty-four Illustrations. London: J. and A. Churchill, 11 New Burlington Street. 1891.

To the student of glaucoma this treatise full of well-executed drawings of experiments to explain the pathological conditions and of the pathological changes found in all forms of glaucoma, is of very great interest. To all those we highly recommend its perusal which will amply repay the time spent on it.

SPECTACLES AND EYEGLASSES, THEIR FORMS, MOUNTINGS AND PROPER ADJUSTMENT. By R. J. Phillips, M.D. With Forty-Seven Illustrations. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut Street. 1892.

This neat little volume contains a great deal of useful information and useful hints for the adjustment of spectacle frames.

DISEASES OF THE EYE, EAR, THROAT AND NOSE. A Manual for for Students and Practitioners. By F. E. Miller, J. F. McEvoy and J. E. Weeks. Philadelphia: Lea Brothers & Co.

How a little quizz-compend can claim the title of a manual for the student and practitioner, we fail to see. Aside from this objection the well illustrated little volume, is probably the best quizz-compend, particularly the part on the eye, which we have become acquainted with.

HAND-BOOK FOR OPTICIANS. A Treatise on the Optical Trade and Its Mechanical Manipulations. By W. Bohne, Optician. Second Edition. Published by the author. No. 119 Canal Street, New Orleans, La. 1892.

The second edition of Mr. Bohne's book, is a great improvement on the first, and the author is to be commended for his zeal in the right direction. We are, however, sorry to see this book burdened with chapters on matters totally foreign to the main object of the book. Particularly the chapters on anatomy of the eye, relief to injured eyes, and one or two others near the end of the volume, might with advantage have been left out.

PHYSICIANS' VISITING LIST. Philadelphia: P. Blakiston, Son & Co. 1893.

As useful as ever to the general practitioner.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES. Edited by
Ch. E. Sajous, M.D., and Seventy Associate Editors.
Philadelphia, New York and London: F. A. Davis. 1892.

This series is too well known by this time to need any special recommendation. Its usefulness is well established.

The above books can be procured from J. H. Chambers &
Co., 914 Locust Street, St. Louis, Mo.

ALT.

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ORIGINAL ARTICLES.

A CASE OF SYMMETRICAL INVASION OF BOTH ORBITS BY A PROBABLY INTRACRANIAL SARCOMA.

BY ADOLF ALT, M. D.

In the November number 1886, of this Journal I reported conjointly with Dr. D. M. Wick, of New Hartford, La., a case of rapidly growing sarcoma of the anterior portions of the brain, which, in its course, invaded both orbits, pressing the eyeballs out of them and leading to rupture of the left cornea with expulsion of the lens, and to ulceration of the right cornea, before death occurred.

The following unfortunate case is very similar to the one reported, although no autopsy was made and consequently no microscopical examination could be obtained.

On February 2, 1892, F. H., twelve and a half years old, was brought to my office for consultation by his family physician Dr. Guelich, of Alton, Ill. He stated that four months previous to this visit the boy, while playing, fell from the roof of a small shed. By this fall the temporal bone over the right

orbit was fractured, and a depressed scar marked the place of fracture when I saw him. After the fracture was healed the boy seemed as well as before the accident and went to school cheerfully. Four weeks previous to this consultation he was attacked by symptoms which were, on account of the prevalence of the epidemic, considered to be due to influenza. Headache and vomiting were frequent and the general condition of the boy became very low. During the weeks between this attack and the visit to me, diplopia and strabismus, as it was thought, had gradually developed, and it was mainly on that account that I was consulted.

I found a slight but undoubted exophthalmus in a down and outward direction. Vision at that time was $\frac{20}{xxx}$ in either eye and could not be improved by means of glasses. The ophthalmoscope showed tortuous veins in both retinæ, but particularly in the right eye. The optic papillæ were somewhat pale. There was, however, no œdema or exudation in the papilla. On exploring the orbit by palpation, a round, hard tumor could be felt behind the trochlea. It seemed smooth and was immovable.

My diagnosis was sarcoma of the right orbit, with a bare possibility that a periosteal abscess might be found instead. Yet, the absence of all inflammatory symptoms did not make the presence of an abscess very probable.

The physician could not believe in the existence of a malignant growth, but he promised, if the boy was in condition to stand an exploration, or if necessary, a radical operation, to bring him to a hospital within a few days.

I neither heard nor saw anything further of the case until March 12th, 1892, when the boy's father came to me to ask me to come in consultation to Alton, as the boy was not in a condition to be brought to me. He stated that the boy could not see with the right eye at all, and had intense headache all the time. He further said that the tissues around the right eye protruded through the palpebral fissure, and that it was thought if I could let out the pus from behind the eye, the boy would get relief.

When I saw the boy the change in his appearance, which had occurred within five weeks, was enormous. He was perfectly emaciated, lay in bed and could not move himself. Vision was totally abolished in the right eye, while the left eye still had bare perception of light. The right eyeball protruded to such an extent that the cornea and a considerable ring of excoriated, engorged and easily bleeding conjunctiva lay bare around it. The cornea was dry and an ophthalmoscopic examination was impossible. When I placed the finger upon the upper lid, it turned up and revealed a solid vascular tumor which crept forward under the conjunctiva and could be seen also in the lower cul-de-sac. I made these examinations while the boy was put under the influence of chloroform. Although I was, of course, convinced of the correctness of my diagnosis of sarcoma of the orbit, the physician, as well as the family of the unfortunate boy, insisted upon my making a trial-incision. I consequently made an incision into the tumor above the eye, which showed it to be a solid but vascular growth. While the child was under the influence of the chloroform I explored the left orbit and found the same conditions. This eyeball, too, was surrounded and pressed forward by the growth, and there was between the two eyes only a difference in degree.

From what I have heard afterwards, the boy lingered about six weeks longer, and the tumors grew way out of the orbits and palpebral fissures before death ensued.

CONSERVATIVE TREATMENT OF STRABISMUS CONVERGENS.¹

BY DR. S. C. AYRES, CINCINNATI.

The treatment of strabismus convergens has passed through many interesting phases since the first operation for its relief was done by Dieffenbach, in 1839. Walton says that the operation was done a hundred years earlier by an Englishman named Taylor, who was a traveling charlatan. His visit to Paris is mentioned in the "Mercury of France," for June, 1837. In a dissertation written by Verkeyden, in 1767, he states that the English treat strabismus by surgical means. I have an old book on Diseases of the Eye, written by Sir William Read, oculist to her Majesty, Queen Anne. It was published in London in 1706. He does not mention any surgical treatment, but says that "if the disease proceeds from repletion, softness and palsy in some muscles, it will be necessary to purge the brain wherein the precedent cause of thic disease was contained: to which purpose to let him chew things in his mouth, and put sternutories into his nose. But if it is engendered by too much want and emptiness of the blood and spirits the sick party must be nourished very well and take to the use of asses' milk. The particular remedies must be fomentations of a moist nature, and the blood of a turtle or pigeon dropped into the eye is very good. He says that some red thing must be fastened on the temples or on the contrary ear to the turning awry of the eye, that the child may turn the eye that way and so amend the deformed sight."

It seems strange now, when it is known for so long a period

¹Read before the Academy of Medicine, January 30, 1893.

that there were four recti muscles to the eye, that surgeons had not ventured earlier to operate for a deformity which was so striking and so well known. It remained for Stromeyer, in 1838, to propose the tenotomy of the internal muscle, and for Dieffenbach, in 1839, to first successfully execute it. The literature on this subject is interesting, and shows a gradual development from the crude ideas of Sir William Read up to the time of Dieffenbach, Donders, von Graefe and the writers of the present day. In fact the question to-day is by no means finally settled, but is in a state of evolution. Great advances have been made in the past few years from the rational study of its true pathology, and the final results have been greatly improved. The operation by Dieffenbach was crude indeed, looking at it from the light of the present day. The muscle was severed so far from its insertion into the sclera, that divergence frequently resulted. He had many followers in Germany and France and England, but the operation fell into disrepute on account of the numerous failures. The original deformity, so far from being corrected, was actually increased, and a diverging, prominent and staring eye was the result.

In the first edition of Lawrence on the eye in 1833, no mention of any surgical treatment for strabismus is made. In the third edition of 1840 he says in the introduction "that the subject of squinting and the new operation for its removal have been fully considered." As to the causes he mentions preternatural contraction of one of the recti muscles, convulsions, mental emotions, teething, disorders of the stomach and bowels, irritation of worms, opacities of the cornea, habit of imitation and other reasons. The operation as described is to incise the conjunctiva over the belly of the muscle, pass a grooved director underneath it, and then, by a single cut, the entire muscle is severed. Before the operation was many months old, the *Medical Gazette* and *Lancet* contained an article inquiring into the causes of the failure of the new operation for the cure of squinting. But the operation had a great popularity for a while, and it was probably performed by many

very incompetent persons, for there were traveling charlatans in those days. When the operations performed by the most skillful were so defective, what could we expect from the others? Haynes Walton, in the first edition of his work, on *Operative Ophthalmic Surgery*, in 1852, says of the causes of strabismus: "It may be that the balance of antagonistic muscular power in the orbital muscles is, from their mechanical disposition, nicer in them than in other muscles; and that they are peculiarly susceptible of disturbance in their harmony, from causes within and without, or more influenced by nervous agency, a cause commonly assigned for the deformity, but one of which we know nothing."

This is an interesting statement as it contains a grain of truth which has developed into a tree of considerable size and strength. He does not mention errors of refraction as a possible or probable cause of the deformity, as he knew nothing about them. But he speaks of a nervous agency of which he, at that time, knew nothing. The clouds which surrounded this subject were cleared away by the genius of a worker in Utrecht, who studied the question at issue from a new and scientific standpoint. To Donders belongs the credit of studying and classifying the errors of refraction and demonstrating their influence on the ocular muscles. In 1864 the New Sydenham Society published his work on the *Anomalies of Accommodation and Refraction of the Eye*. It is a work which will stand as an enduring monument to his name, and will mark an epoch in the phenomenal development of ophthalmology.

In it he states that strabismus convergens almost always depends upon hypermetropia, and in discussing the origin of strabismus says that it is promoted by circumstances which render convergence easier, and mentions a peculiar structure or innervation of the muscle. The former cause was better known to him than the latter, and it is possible that he attributed too much to it, as the latest investigations tend to show that the innervation of the muscles is a very important factor.

Noyes, in his work on *Diseases of the Eye*, published in 1881, refers to Donders as regarding "converging squint and

hypermetropia as standing almost universally for cause and effect." He remarks, "large observation has modified these views, and while we find that hypermetropia acts the most important part in the production of converging squint, we have many statistics to show that essential muscular defects are also operative." In his larger work (1890) he says the occurrence of strabismus is evidently determined by a variety of factors, and amongst the most potent is the actual power of the muscles of adduction and abduction.

Stellwag, in the first edition of his work in 1868, says anomalies of refraction together with occupations which require excessive tension and relaxation of the muscle of accommodation for the purpose of distinct vision, are, in the greater number of cases the cause of squint. Less frequently, the cause lies in a preponderance or weakness of a certain ocular muscle.

Hansen Grut, in "Transactions of Ophthalmological Society," 1888-9, says "that convergent strabismus is the result of an innervation which produces a greater shortening of the recti than is desirable. If this abnormal innervation ceases either permanently or temporarily the strabismus disappears."

Valude, in *Archiv. d' Ophth.* vol. X, after reporting the clinical history of thirty cases of strabismus comes to the conclusion "that ordinary concomitant strabismus does not depend on ametropia alone, and that the explanation of Donders probably does not even fit the majority of cases, but that a neuropathic disposition is an important, sometimes the principal, factor in the development of strabismus. There are cases in which ametropia alone, in others the nervous affection and in still others both combined are the cause."

Very much more might be added showing the views of men eminent in the profession who have studied these points in the most careful and exact manner. We may then sum up the question briefly: We have convergent strabismus beginning

Review, *Archiv. Ophth.*

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in early life, generally from the second to the fifth year, but occasionally in the first year. It is intermittent at first, but finally becomes constant. It may affect one eye or it may be alternating. It is a defect which parents want removed if possible. How can it be done most safely and satisfactorily for the patient? There are a *few* cases where the degree of convergence is so high that surgical measures have to be resorted to. In these there is a marked shortening of the internal rectus and a very weak condition of the external. But these, in my judgment, constitute the minority. The prognosis will depend something on the length of time the squint has existed. In all cases the refraction should be tested and the anomaly recorded. A large proportion will be found to have hyperopia. In children who cannot read, the degree of the error will have to be estimated by the ophthalmoscope. The degree of hyperopia will vary very much in these cases. It will be surprisingly low in some, some will have compound hyperopic astigmatism and some myopia. In cases of hyperopia the manifest hyperopia should be fully corrected. The child should be given as strong glasses as he will tolerate and be compelled to wear them constantly. The influence of these glasses on the squint will not always be seen at once. It may be a few months before it can be detected. Their influence on the accommodation, however, can be noticed immediately. The comfort with which children wear glasses is surprising to those who do not understand the scientific explanation of their use.

When the eyes are directed to a near object two things take place in the visual act. We converge and we accommodate. The convergence is brought about by the internal muscles, and if they are not strong enough to maintain this position for a prolonged time they become unsteady and painful and demand rest. The accommodation is brought about by the action of the ciliary muscle on the crystalline lens. In hyperopes the strain upon the accommodation is very great and an effort to converge and accommodate at the same time causes pain and fatigue of the eyes. This condition associated with

a want of balance of the muscle favors the development of strabismus. For many years Donders' explanation of the cause of strabismus was fully accepted, and with very good reason, for the adjustment of glasses relieved the spasm and helped to correct the squint. But it did not fully explain the conditions. Examinations of many thousands of eyes showed that the principal refractive error was hyperopia, and that the number of cases affected with strabismus among them was comparatively small. It was also shown that many cases of convergent strabismus were found among myopes. Without going into the discussion of the subject more fully, I will only say that scientific investigators were compelled to look for something in addition to hyperopia to account for the squint. The quotations I have made bear on this point, and many more opinions might be added. I have said above that in the treatment of a case of squint the first thing to do is to estimate the error of refraction and then correct it. The patient should be tested every year to see if the glasses are comfortable and satisfactory. When glasses are first adjusted to a child from two to five years of age, there are possible errors in the correction of the refraction which will not occur in a child old enough to read. Then, too, even children who can read will pass a more satisfactory examination the second time than the first. They have become accustomed to the glasses and the eyes adjust themselves to them after constant use for a few months. In addition to this, and a point which is very important, you will have a chance to see the influence of the glasses on the convergence. In my judgment, therefore, except in very high degrees of squint, it is better for the child to wear the correcting lenses for a period of from one to four years before a tenotomy is made. This may seem very conservative, but I think that *final* results will bear me out in this position. The primary results of many skillfully made tenotomies are very satisfactory for a period of five years or even longer. But examine these cases later on and what do you find? A moderate and even a pronounced divergence. Can we avoid this result? Stellwag speaks of persons who outgrow strabismus, and every

oculist has seen them. Does this not prove that there is a want of muscular balance which has a tendency to correct itself as the child develops into manhood or womanhood? This is the factor which tends to bring about the bad results which we used to see so frequently some years ago. Let me give you a typical case illustrating the influence of glasses. Boy, æt. 7, convergent strabismus—moderate degree of H. After he had worn the glasses a few months his eyes were parallel and continued so as long as he wore them, but as soon as he removed them the squint returned. He saw perfectly in the distance with them and could study without discomfort. He wore the glasses seven years and then said he could not see in the distance with them. He was allowed to use them only for study. A year later he said he could not study *with* them, and this proved to be true, and he was allowed to take them off. His eyes were then perfectly parallel and he had no asthenopic symptoms. Nor has he had any since. A tenotomy in his case when first seen would certainly have been followed by a marked divergence. The glasses corrected the squint, but his H. remained the same. It certainly was not the H. alone which caused the squint. It was H. plus a want of innervation of the muscles. After the boy had grown and developed physically his ocular muscles no longer needed the aid which the glasses gave. Not all, and in fact not many children, will be able to take their glasses off at fifteen or sixteen, but if they will begin to wear glasses soon after the squint shows itself they can hope to correct it. I could give the notes of scores of cases of children whose strabismus was relieved by glasses.

I would say then, put glasses on as soon as possible after the squint shows itself. Last summer I prescribed glasses for a child only two years and two months old,¹ and she wore them with perfect comfort, and, strange to say, asked for them as soon as she woke in the morning. I have frequently ordered glasses for children three and four years old. To do much

¹See AMERICAN JOURNAL OF OPHTHALMOLOGY, Vol. IX, page 339.

good glasses must be adjusted soon after the squint has developed, but even in cases of long standing I would give the glasses a trial before resorting to a tenotomy.

I would say this in conclusion, that except in very high degrees of strabismus I would prescribe glasses and direct the course of study if the child is in school. Tests should be made from time to time to see the influence of the glasses and to determine whether or not they need changing. This applies more particularly to children from three to nine years of age. After a trial for two or three years, without decided benefit to the convergence, I would not hesitate to operate. In children from ten to fifteen the correction of the H. will not do so much good. In them care should be taken in operating and the error of refraction corrected first.

A conservative course in these cases will save the surgeon from some feeling of regret and the patients from an unsightly deformity which is greater than the original one.

As there is always a slight advancement of the eye after tenotomy of the internal rectus, I think it better in many cases to make a limited tenotomy of both interni. In this way the prominence is equalized and the eyes present a more natural appearance. When the eyes are prominent this precaution is more necessary than when they are deep set. I feel quite safe in asserting that the profession has belittled the importance of strabismus operations. It requires much skill and judgment to do them successfully, and many important points have to be considered before determining the propriety of the operation. They are usually done on children who have long life before them, and can not afford to have their deformity made worse. You may have heard men say I can straighten eyes but I would not attempt a cataract extraction. If they knew more of the final results of strabismus they would decline them also.

A CASE OF GUMMA OF THE SCLEROTIC.

BY ADOLF ALT, M.D.

According to Alexander (Syphilis of the Eye) well authenticated cases of gumma of the sclerotic, have been reported but rarely, while gumma of the ciliary body involving the sclerotic has been more frequently recorded.

Mrs. A. H., thirty-five years old, consulted me on September 16, 1892, on account of a small swelling, situated near the corneal margin up and inwards, of the left eye. She told me that it had been in existence for three weeks, but that she had a very sick baby, six weeks old, whom she nursed and therefore could not see me any earlier. Inquiry and examination revealed no signs of constitutional trouble and I took the case to be one of rheumatic episcleritis. One strange feature about the swelling was, that it seemed necrotic in the centre, having a yellowish semi-transparent appearance. This apparently necrotic spot grew within a few days so much that I made a small incision to remove, what I thought to be pus. However, the incision revealed it to be a lardaceous tissue and not pus. The treatment which consisted in salicylate of sodium internally and local massage with aristol-ointment did not influence the continued growth of the swelling in the least. About two weeks after I had first seen her, the child died. She now complained of sore throat and I found the pre-auricular glands slightly swollen. Instead of the salicylate of sodium, I now gave the iodide of sodium, thinking that I had to deal with a late manifestation of syphilis. This, however, made no change in the spreading of the growth, which gradually formed a hard semilunar ridge around the upper half of the cornea. On October 27, a papulous syphilide made its ap-

pearance all over her body. I now gave mercury internally and gradually an improvement began to set in. Infection was absolutely denied, and perhaps really not known, by her. The husband kept out of my way and I am, therefore, at a loss to know anything with regard to its time. The mode of appearance of the symptoms while I saw her was surely an unusual one. First a gumma of the sclerotic, then swelling of the pre-auricular glands and sore throat, and finally a skin eruption. No local application I had made, seemed of any value in the treatment of the scleral growth. Finally I made inspergations of calomel, in spite of the internal exhibition of iodide of sodium. Under this local treatment the tumor shrank rapidly, and in its stead nothing but a slight depression of the sclerotic corresponding to the original seat of the swelling, remained in the latter part of December. I had meanwhile turned her over to her physician, who told me that the child died of marasmus, which I suppose was congenital syphilis.

CORRESPONDENCE.

TO THE OPHTHALMIC SURGEONS OF THE WEST- ERN CONTINENT, THE PAN-AMERI- CAN MEDICAL CONGRESS SENDS GREETING!

It asks their aid to make this the greatest gathering of American Physicians that has ever taken place. The meetings will be held in Washington, D. C., on September, 5, 6, 7 and 8, 1893. It is to be a part of the scientific work of the Columbian Exposition, which will attract the eyes of the world to Chicago. I have been honored in being put in charge of the Ophthalmic Section of the Congress, and naturally desire that this department shall be at least the co-equal of any of the various sections, in the good scientific work the Congress is expected to exhibit.

Ophthalmology, the first of the medical specialties to attract the attention of surgeons, took the lead in the great advance of modern medicine; and it keeps abreast with the most zealous in developing that science which has for its sole aim the health and welfare of the human race. Eye sight is essential to the world's progress. How best to preserve it is a study in which man must ever take the deepest interest. While we know much in this connection, there is a great deal more to be learned. We need light on all points in ophthalmic practice, so that the tendency of diseases towards the destruction of the eye sight may be checked.

In certain directions immense progress has been made. Those blind from cataract now receive their sight through a perfected operative manual. Would that we could say the

same for chronic glaucoma, and for the detachment of the retina. The pathology of sympathetic ophthalmia, and how to prevent its frightful ravages, is much needed information. We are familiar with the disturbing influences which the various eye nerves occasion. The recognition and the correction of refractive errors give brilliant results in the relief of eye and head pains; yet we know that glasses alone do not always remove the annoying head discomforts which badly-working eyes produce. The want of concordance in the action of the eye muscles is often a barrier to relief. How to manipulate these, so as to stop annoying reflexes, is a want which all recognize.

How to stop the progress of nerve atrophy and turn back the stream of health-giving impulses is also knowledge anxiously desired. What to expect from electricity in the strengthening of eye muscles, and electrolysis in removing opacities of the cornea, are subjects full of interest in a field comparatively unexplored. There is no part of ophthalmology so well known that additional information is not needed.

In the four (4) days of the congress, devoted to the reading and discussion of papers, we expect to be instructed on many obscure points of eye pathology. We hope that all ophthalmic surgeons will give to the meetings not only their presence, but also their experience on special points, to which they have given the more careful study; for as is well known in our specialty, there are many specialties.

The Columbian Exposition, of which we are an outgrowth, will be an institution long to be remembered. Let it also be said of the Pan-American Medical Congress that it has put scientific medicine upon a much more advanced platform than had existed prior to the meeting. This ophthalmic section of the Congress is open to each and every member of the medical profession of the Western Hemisphere pursuing the study and practice of ophthalmology. Each one is especially invited to be present at the meetings of the Section. We desire carefully prepared papers to be read and discussed. Will you prepare a paper on whatever your professional experience has

taught you to be especially good or new, in ophthalmology? or will you come prepared to discuss the subjects which will be introduced to the Congress by the reading of papers? In any case come to the Pan-American Medical Congress in September, 1893.

JULIAN J. CHISOLM, M. D., L. L. D.,
Pres. of Ophthalmological Section
Pan-American Medical Congress.

114 West Franklin Street, Baltimore, Md., Dec. 15, 1892.

OPHTHALMOLOGICAL SECTION OF THE PAN-AMERICAN MEDICAL CONGRESS.

Dr. Julian J. Chisolm, of Baltimore, who is the Chief of the Ophthalmological Section of the Congress, has organized his department with the following gentlemen, well known, as ophthalmic surgeons:

Dr. Geo. M. Gould, of Philadelphia, English-speaking Secretary; Dr. J. Harris Pierpont, of Pensacola, Spanish-speaking Secretary.

THE HONORABLE PRESIDENTS OF THIS SECTION ARE.—Drs. Herman Knapp, New York; Eugene Smith, Detroit; Stephen C. Ayres, Cincinnati; J. L. Thompson, Indianapolis; X. C. Scott, Cleveland; Abner Calhoun, Atlanta; Herbert Harlan, Baltimore; Chas. W. Kollock, Charleston; Stephen C. Richey, Washington; Jose Ramos, City of Mexico; G. C. Savage, Nashville; J. E. Minney, Topeka; W. H. Carmalt, New Haven; H. J. Baldwin, Montgomery; Aurelio Alarco, Lima, Peru; Carlos Finley, Havana, Cuba; Hasket Derby, Boston; J. C. Kipp, New York; Dudley S. Reynolds, Louisville; Maximo Cienfuegos, Santiago; F. C. Hotz, Chicago; Chas. E. Michael, St. Louis; Samuel D. Risley, Philadelphia; R. H. Lewis, Raleigh; T. E. Murrill, Little Rock; E. C. Rivers, Denver; C. M. Shields, Richmond; J. F. Fulton, St. Paul.

IN THE ADVISORY COUNCIL ARE THE FOLLOWING OPHTHALMIC

SURGEONS.—Drs. Adolf Alt, St Louis; L. W. Fox, Philadelphia; Geo. T. Stevens, New York; Edward Jackson, Philadelphia; B. A. Randall, Philadelphia; H. V. Wurdeman, Milwaukee; R. Sattler, Cincinnati; J. J. Thompson, Kansas City; L. Connor, Detroit; Hiram Woods, Baltimore; R. L. Randolph, Baltimore; J. A. White Richmond; S. M. Burnett, Washington; A. R. Baxter, Cleveland; J. P. Parker, Kansas City.

SECTION OF OTOTOLOGY.

HONORARY PRESIDENTS.—Drs. Adolf Alt, St. Louis, Mo.; Albert A. Buck, New York; Gorham Bacon, New York; Wm. Cheatham, Louisville, Ky.; Francisco de P. Chacón, City of Mexico; Sebastian Cuervo y Serrano, Sancti Spiritu, Cuba; J. C. Connel, Toronto, Canada; Stephen Dodge, Halifax, Nova Scotia; J. B. Eaton, Portland, Oregon; A. A. Foucher, Montreal; John F. Fulton, St. Paul; J. Wilford Good, Winnipeg, Manitoba; Francis B. Loring, Washington, D. C.; Henry D. Noyes, New York; Arturo Costa Pruneda, Santiago, Chile; Charles Inslee Pardee, New York; G. Sterling Ryerson, Toronto, Canada; D. B. St. John Roosa New York; W. H. Sanders, Mobile, Ala.; Belisario Sosa, Lima, Peru; G. C. Savage, Nashville, Tenn.; J. J. Vermyne, New Bedford, Mass.

EXECUTIVE PRESIDENT.—Dr. C. M. Hobby, Iowa City, Iowa.

SECRETARIES.—Dr. Max Thorner (English-speaking), Cincinnati, O.; Dr. H. McHatton, (Spanish speaking), Macon, Ga.

Drs. Fernando Perez [Juncal 809] Buenos Aires, Argentine Republic; Ernesto Mazze, La Paz, Bolivia; Theodore Peckolt, (Jor) Rio de Janeiro U. S. S. of Brazil; J. H. Wishart, Toronto, Canada; Carlos Desvernine [Cuba 52] Havana, Cuba; Carlos Esguerra, Bogota, Republic of Columbia; Demetrio Orantes, Guatemal City, Guatemala; H. G. McGrew, Honolulu, Hawaii; Antonio Penafiel, [Escuela de Medicina] City of Mexico, Mexico; Montenegro, Leon, Nicaragua; N. Surh [Iturango 265] Montevideo, Uruguay; Foción F., Cordero F., Merida, Venezuela.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, DECEMBER, 8, 1892.

HENRY POWERS, F. R. C. S., President in the Chair.

KERATO-MALACIA IN YOUNG CHILDREN.

Mr. Holmes Spicer read this paper, with notes of several cases. Young children are more liable than adults to gangrene of the cornea when their vitality is reduced below a certain level; the gangrene may occur spontaneously or as the result of comparatively slight attacks of conjunctivitis. In the late stages of tuberculous meningitis and in infantile diarrhœa, the cornea undergoes destruction, but this is due partly to exposure and partly to insensibility. After measles or whooping-cough with bronchitis, and in malignant varicella, where there has been much exhaustion, the cornea is not infrequently seriously damaged by large perforating ulcers. After serious malnutrition the cornea may slough spontaneously; this is not uncommon among nurslings in countries where the mothers practice long religious fasts; in this country it is rare except among the hand-reared, who have had insufficient nitrogenous diet. Kerato-malacia generally attacks both eyes of children from four to nine months old; it begins with dryness of the conjunctiva, with patches of froth on its surface, and with night-blindness; soon the whole cornea becomes opaque and perforation occurs; the cases often terminate fatally. The treatment should be increase of the nitrogenous elements of food, some meat juice or raw meat finely pounded, in addition to milk for young babies, and cod-liver oil; and locally, eserine

in the form of ointment, to the eye, with warm applications to the lids. Some of the cases with this treatment made a good recovery; in one case the cornea recovered, although the child succumbed eventually.

The President spoke of kerato-molacia in adults, and mentioned a case he had recently seen in a woman completely crippled by deforming arthritis.

Mr. Drake-Brockman had met with many cases of keratomalacia in India during famine, and in epidemics of cholera, and not infrequently in chronic dysentery. In children the condition was, he thought, often associated with congenital syphilis. In some cases destruction of the cornea occurred with extraordinary rapidity.

Mr. Doyne mentioned the case of a child six weeks old, in which the cornea eventually cleared almost completely.

Dr. Priestley Smith (Birmingham) referred to the necessity of carefully watching the cornea in children and others prostrated by serious illness. In such cases the corneæ were often exposed during sleep, and were prone to severe ulceration. Protection of the corneæ by a bandage, or adhesive plaster on the eyelids will often prevent this dangerous complication. Sometimes union of the margins of the lids is necessary, and to effect this he had had recourse to a procedure differing a little from that ordinarily employed in blepharoplasty. He split each lid at the margin, in its long axis (as in Arlt's operation for trichiasis), and by means of stitches brought together the raw surfaces of the gaps in the upper and lower lids. By this means no loss of tissue was incurred, and in his experience the results were very satisfactory.

PANOPHTHALMITIS FOLLOWING LACHRYMAL ABSCESS.

Dr. Rockliffe (Hull) read notes on this case. The patient, aged 63, had suffered for thirty years from lachrymal obstruction, but never before the present attack from abscess of the sac. The suppuration in the lachrymal sac was followed by conjunctivitis, chemosis, keratitis with hypopyon, panophthalmitis, and excision of the globe. On examination the whole

eyeball was filled with inflammatory products, and there had been much matting of the orbital tissues.

Dr. Hill Griffith (Manchester) thought that if the cornea had entirely escaped injury, the case was unique. He had seen one case in which suppurative panophthalmitis had followed lachrymal abscess, but in that instance the cornea became accidentally abraded by the end of a lead style.

Mr. Adams Frost referred to a case in which infection of the orbital cellular tissue occurred through a small wound of the conjunctiva, and led to complete destruction of the eyeball.

CICATRICAL ECTROPION TREATED BY TWEEDY'S OPERATION.

Dr. Rockcliffe (Hull) reported the case of a man who had been kicked in the face by a horse, dividing the lower lid close to the inner canthus, and splitting the cheek open. The resulting cicatrix produced ectropion. Tweedy's operation was performed with results quite as satisfactory as in cases in which the deformity was at the outer canthus.

A CASE OF PROBABLE RUPTURE OF THE OPTIC NERVE.

Dr. Johnson Taylor (Norwich) read notes of the case of a young man, who in stooping to pick up kindling wood, struck his right lower eyelid violently against the end of a piece of wood standing obliquely on the floor, with the result of immediate and permanent loss of sight in the right eye. The neighboring bone was not struck, there was no probability of penetration, the skin alone of the lid appeared to have been broken; no tenderness or swelling of the eyelid, or conjunctiva followed, and only slight temporary patchy discoloration of the skin resulted. No headache, vomiting, or other symptoms ensued, the patient immediately resumed his work and continued it for several hours. When seen for the first time, five days later, the right eye had no perception of light, the direct pupillary reflex was entirely absent; the indirect reflex and contraction of the pupil with convergence were normal; movements of globe normal. The appearances on ophthalmoscopic examination were almost *nil*, and quite inadequate to explain the symptoms. About five weeks later the optic disc showed

decided signs of atrophy. After discussing the possible explanations of the case, Dr. Taylor suggested that the optic nerve had been ruptured either by sudden violent and extreme rotation of the globe, or by overstretching, the result of the sudden proptosis produced by the piece of wood being driven in between the eyeball and the lower orbital margin. The patient was shown at the meeting.

Mr. Adams Frost mentioned a case he had seen at Moorfields, in which the stem of a tobacco-pipe had penetrated the orbit and ruptured the optic nerve. The disc became recognizably atrophic in four to six weeks. The external wound was so insignificant that if the pipe stem had not remained in the orbit till the patient came to the hospital, it would have been impossible to say that there had been more than a cutaneous wound. He thought that in Dr. Taylor's case, direct injury to the nerve by penetration of the piece of wood was the more plausible explanation.

Mr. C. Wray spoke of a patient under his care, in whom, after removal of the blind eye, an orbital exostosis was found, against which the nerve might easily have been compressed.

Mr. Bullar (Southampton) referred to a case, in some respects similar to Dr. Taylor's, in which there had evidently been a perforating wound of orbit.

Mr. Tweedy mentioned the case of a man under his care at University College Hospital, in whom a piece of tobacco pipe stem had entered the orbit, damaged the optic nerve, causing blindness, and had remained in the orbital tissues for two years. The man was unaware that he had received any injury other than a "scratch" on the eye.

THE NEW YORK OPHTHALMOLOGICAL SOCIETY.

At the annual meeting, held on Monday, January 9, the following officers were elected: President, Dr. W. F. Mittendorf; Vice-President, Dr. W. S. Bennett; Secretary and Treasurer, Dr. Frank N. Lewis; Committee on Admissions, Dr. H. D. Noyes, Dr. C. E. Hackley, and Dr. David Webster.

SELECTIONS.

A CASE OF INFANTILE MENINGEAL HÆMOR- RHAGE—RESULT SO-CALLED CONGENI- TAL CHOREA—BLINDNESS?—DEAF- NESS?—REMARKS.

BY JOHN DUNN, M. D., OF RICHMOND, VA.,
Chief of Clinic of Richmond Eye, Ear, and Throat Infirmary.

July 27, 1892—History is as follows: Claude F., born November 15, 1891; birth natural; head presentation; time from first pain until birth of child, three hours; has three brothers and one sister, all healthy; no evidence of past specific history. The night following the birth of the child the mother remembers to have had her attention called to the fact that the child noticed the lamp in the room. On the second night after its birth, the child began to scream; to foam at the mouth, and to “gum” or “suck” its tongue so violently that the froth coming from its mouth was bloody; at the same time, the child had severe convulsions, during which its forearms were flexed upon its arms, and its fingers “clinched;” its eyes turned upwards as far as possible. The spasmodic contractions lasted about ten minutes. The child was fretful, and cried for several hours following them. About six hours after the first attack, a similar attack of “spasms” set in, which again lasted about ten minutes. On the fifth and eighth day after its birth, the child had similar attacks of about the same duration; since then, there have been no severe convulsive attacks. During the last attack the child turned a “water-wave purple” all over, and the mother feared instant death would take place. Since

the last attack, the child has never voluntarily moved its arms, which are flexed at the elbow, the fists balled, and held close to the side. It has been able to move its legs, although all its strength seems to be in the thighs, and all the movements seems to originate at the hipjoint. If the child be held up by the arms so that the legs hang free, the heels are seen to be drawn up so that the toes point to the ground, in which position they remain, flexion of the ankle being lost. The child has never made any effort to move its body. If the child be held up, and its head be placed forward so that the chin rests upon the chest, it remains there the muscles of the neck making no effort to raise it; while if the head be held erect, it will fall backwards as far as possible, and then remain in this position, the child being unable to raise it. When the child is lying on its back, with its head resting on a pillow, it has the power to roll its head from side to side, and often does so in quick succession. Several times a day the child will roll its eyes up and down spasmodically; while all during the day, and even when the child is asleep, there are noticed spasmodic jerkings and twitchings of the feet and arms. The child has never "taken notice" of any object or sound. Shaking objects close to the eyes does not cause the eyes to wink. The child takes no notice of a cap fired close to its ears. The pupils respond to light, are normal in size, and dilate under atropia. Ophthalmoscopically the fundus is normal, unless there be a slight paleness of the optic discs. There is no paralysis of the eye muscles, nor of any of the muscles of the face. For the first few days after its birth, the child showed no desire to "take the breast," and it was only after considerable "training," that it learned to avail itself of this source of nourishment. Although the child will not notice a strong light, when flashed into the eye a second or a third time, it will turn its eyes towards the light, but as quickly turn them away. The child seems to know its mother, but whether it has learned to know her through the sense of touch or of hearing, it is hard to say—probably through the former. Although it will not notice even loud noises close to its ears, when its mother is

talking to it, the child shows a certain degree of satisfaction, as though the sensations it perceived were pleasurable. The child has never made any effort to sit up, or crawl, or speak. Mercurial inunctions and pilocarpine were ordered.

September 6, 1892.—The above treatment has been persevered in, more or less faithfully, with the result that the infant no longer carries its arms flexed at its side, but can move them about with considerable freedom. Light seems to make more impression upon the eyes than when treatment was begun. In other respects, there has been no amelioration in the condition of the child.

November 15.—Condition about the same.

Both the history of the case and the symptoms point to meningeal hæmorrhage as the cause of the trouble. The cause of the hæmorrhage it is difficult to make out, in this case, a probable conjecture; it seems likely that, as in the great majority of these cases, in was "due to the special conditions of parturition," for the birth was, in every way normal and easy, and for forty-eight hours the child was apparently perfectly healthy, and "just like other babies;" furthermore, during this time it did what it never done since, noticed a light when brought into the room at night. *While* it is true that, in a majority of the case of infantile meningeal hæmorrhage, "nothing particular is noticed in the condition of the child during the first few days or weeks of life," this very *while* makes it not improbable that the hæmorrhage, in a certain proportion of these cases, is the result of injury received after birth, rather than at the time of birth. Perhaps, in dressing or in handling this child, the injury was done to the head that resulted in the hæmorrhage. The spasms, and the epileptiform foaming at the mouth, appeared as symptoms that the hæmorrhage was in such quantities as to produce compression with irritation, or perhaps destruction of the brain cortex in its vicinity.

The localization of the seat of the hæmorrhage in this case is more difficult than is generally the case in brain lesions, the majority of which can now be made with considerable accuracy. The difficulty lies in the extent of the lesions. The

lesion affects, as far as we may see, both sides alike, and to an equal degree. The symptoms point to a hæmorrhage from the region of the longitudinal sinus, which involved most likely, by compression, large areas of the brain cortex on either side. Whether or not the median surfaces of the brain are affected is uncertain.

It is a question whether the child is blind, or whether it is unable to distinguish between the objects that pass before the eyes; whether it is blind, or whether it is utterly unable to interpret the sensations produced by pictures upon the retina; whether the higher centers for sight have been destroyed; whether, if the higher centres, the interpreting areas, have been deprived of their function, there will occur atrophy of the optic nerve as a result.

At present, the condition of affairs seems to be about as follows: The pupils respond to light, showing the reflex arc for light is intact; the optic media being healthy and normal, pictures form upon the retina, and corresponding nerve-waves start along the optic nerves for the sight-sensorium, this being injured to a great degree or destroyed, the optic nerve sensations are not interpreted at all.

While from the standpoint of usefulness it is the same to the child whether it is blind, or whether it is deprived of the power of interpreting the significance of *what it sees*—(*i. e.* of the retinal impressions), from a medical view the two conditions are different, and it will be interesting to know if a continuance of the second condition will ultimately, as a necessary consequence, result in the first. Perhaps not. The disturbance to the sight-power was probably the result of compression of the brain cortex in the region of the occipital convolutions and the cuneus. If these convolutions have been compressed to such a degree that atrophy has resulted, or if these convolutions have been destroyed, actual blindness is the condition from which the child suffers. If the destruction has been complete, it is no longer a question of light, or darkness, or form, or color, for these cannot then exist for the child who is left in the condition of a being created without

the sense of sight—one to whom perpetual darkness means no more than perpetual sunshine, and one to whom these terms must remain incomprehensible. If, on the other hand, these sight areas be perfectly healthy, while there has been a destruction of the association fibres, which connect the sight areas with the other parts of the brain (and the best marked of these association tracts connect the occipital lobes with the frontal lobes, sight with the intellect), the while the optic fibres bring intact the sensations of color or of form to the occipital lobes, there is no interpretation of the meaning of these sensations. The infant suffers from *idiot blindness*.

It would, again, be interesting to know, in this latter condition, how far instinct would develop reflexes from these sight sensations; how far these sight sensations could be the source of pleasure or discomfort; whether there would result a certain amount of gratification in opening the eyes to the light of day rather than to darkness.

There is still another question just here: Are these cortical areas, if irritated, the source of hallucinations purely visual? Are there, from time to time, sparks or flashes of light of various colors before the eyes, such as at times result from irritation of the occipital convolutions?

A similar series of problems offer themselves for solution in regard to the power of hearing. Sound-waves reach the eardrums; these vibrate, and the vibrations are transmitted to the terminals of the nerves of hearing, whence awaked waves proceed until they reach the impaired or destroyed centers for the interpretation of these waves, and again the child may be physically deaf, or may suffer from *idiot deafness*.

As regards the interpretation of stimulations affecting the nerves of smell or taste, the infant is too small to make experiments with the hope of success. No diminution can be shown of the sensations of pain or touch. The irregular spasmodic movements, choreic, which present themselves in this case have the peculiarity that they do not cease during sleep, and are often severe enough to awaken the child; they

differ in this respect from the large majority of other cases of chorea.

The prognosis in this case is bad. It is not improbable that large areas of the brain cortex are compressed or worse injured. As the brain substance, once destroyed, is never regenerated, the chances are that the mental powers of this child will remain weak beyond hope. And there is no way of accurately forecasting the ultimate condition of the child. It is highly probable that as time goes on, it will gradually acquire more or less control of its arms and legs, the movements of which, at present show marked incoordination. A certain proportion of these cases, however, improve beyond what seems to be a reasonable expectation in the light of the nature and duration of the symptoms.

Mercurial ointment was prescribed with the hope that it might hasten the absorption of the remains of the hæmorrhage—not from the belief that the case was syphilitic, and the improvement obtained must, in all likelihood, be attributed rather to time than to the *vis medicatrix medicine*.

A SECOND CASE OF CONGENITAL CHOREA—CHILD 13 YEARS OF AGE, WHO CAN SEE AND HEAR, BUT WHO HAS NEVER LEARNED TO SPEAK, AND AS YET HAS NEVER BEEN ABLE TO LEARN TO WRITE—A SUPPLEMENT CASE TO THE PRECEDING ONE.—DIMINUTION OF THE CHOREIC MOVEMENTS, WITH THE USE OF GLASSES.

The following case, which came under my observation after the notes upon the first case had been made, serves to bring up several interesting phases of the results of infantile meningeal hæmorrhage, which phases were, in the above case, from the nature of these reports of cases, necessarily omitted.

Annie Page, aged 13; birth prolonged and difficult; healthy brothers and sisters; brought for treatment because she had "never learned to talk like other children;" is small for her age; head is very small; patient badly nourished; arms and legs not out of proportion to her bodily development, although

both are poorly developed; right grip weaker than left; no demonstrable fault of larynx, pharynx, palate, etc., under laryngoscope; no form of facial paralysis; there are spasmodic jerkings of the muscles about the corner of the mouth, more frequently on the right side; these spasms occur every minute or two, and cause the face to assume a silly smile; there is also a spasmodic winking of the right eye. The choreic movements affect both arms, producing, especially, a spasmodic shrugging of the shoulders; these movements occur more frequently in the right than in the left side, and, as far as I can judge, these choreic arm movements are all produced by the shoulder-movements. The little girl did not learn to walk until she was 3 years old. As she could move her arms and legs with considerable freedom, and as she could not sit up, the weakness must have been in the muscles of her back, from which weakness she has not as yet entirely recovered. The patient has had both varioloid and measles, and the eruptions of both diseases were confined entirely to the right side. She was vaccinated at the same time in both arms; in the left arm, the virus "failed to take."

The interesting features of the case are that the child has never learned to talk, and cannot be taught to write—"because she cannot remember her letters," say her mother. The child hears fairly well, and understands what is said to her. Told to repeat the alphabet after me, her vocal apparatus emitted the following sounds:

a was a,	j was äe,	s was ae,
b was b,	k was äe,	t was e,
c was e,	l was ä,	u was e,
d was e,	m was äe,	v was e,
e was e,	n was äe,	w was r (German ä),
f was ä,	o was o,	x was äe,
g was e,	p was e,	y was i,
h was a,	q was e,	z was äe.
i was i,	r was r, (German ä)	

If asked her name, Annie Page, she will reply "a a." For

yes she says "æ;" for no, she says "or." There is, however, no rolling sound to the r, but the "or" is the German *ä*. If we examine a moment the child's power to pronounce sounds, we shall see it is very limited. Its alphabet consists of a, b, e, i and o, and the German *ä*; all purely vowel sounds, except b, which the child can say distinctly. The child endeavors to answer any question asked her, but her words are combinations of the above vowel sounds. If asked to repeat any word of more than one syllable; she says always "æe." The patient knows a number of the letters by sight, but can be taught to make only two of them, a and b, and these two letters but imperfectly. The endeavor to make any other letter results in the formation of an o. The child's sight is imperfect, owing to the existence of a high degree of hyperopic astigmatism; for several years at varying intervals, the child has been subject to visual hallucinations; has seemed to see objects before her which no one else in the room could see; she would run to me, bury her face in my lap, and then from time to time, would look out, and would again hide her face as though she still saw something." The child has been less subject to these hallucinations for the past year or two than formerly.

This is again a case of infantile meningeal hæmorrhage, and the parts of the brain which, it would seem, were the seat of the greatest permanent injury, are Broca's centre, the posterior part of the third frontal convolution, and what is supposed to be the centre for movements necessary for writing, the posterior part of the second frontal convolution, and the immediately adjacent areas, and these areas of the left side—perhaps both sides, but greater on the left. Although this seems, at first blush, to be a satisfactory solution of the question of localization, the problems of the case are not settled so easily. The child recognizes objects seen, knows their use, understands spoken language, can carry in her mind commands given her and will obey them; nor can it be proved, so far as I can judge, that the sensations of touch, of feeling, or of smell, are misinterpreted by her. All this goes to show

that the regions of the brain where preceptions of sight, of touch, of smell, of hearing, are stored away and correlated, resulting in ideas, have retained their functions. No apraxia can be proven. The patient has, however, true motor aphasia, almost complete. Say to her, "Do you know what a chair is?" She will reply, "æ," while the expression of her face shows that she understands you. Point to a table and say, "Is that a chair?" Her reply is "or." Point to the chair, she says, "æ." Say to her, "Say chair," and her reply is "æ," while the expression of her face shows that she is disappointed at her failure, which she recognizes, to repeat the word you have spoken. This seems to show that the part of the brain (Broca's centre), where normally is stored away—not the memory of the spoken word, chair, but the memory of the combination of motions necessary to the sound production of the word chair—is not functioning. The auditory centre for spoken words is intact, and impulses start from this to the centre for originating spoken words. These impulses reach a diseased, perhaps, in a great measure, atrophied area, and result in the production of the sound "ä" which, as soon as spoken, is recognized by the child's auditory centre for spoken words as incorrect, and results in the facial expression denoting dissatisfaction. There seems to remain of Broca's centre a part capable of performing, to a certain small degree, its functions, for the child can repeat, after you, a, b, e, o, i; but, although she can do this, she cannot make intelligible use of these sounds in words containing them, and most of her endeavors to repeat words after you, no matter what the words is, result in "æ."

So, too, there seems to be destroyed, in a great measure, the posterior part of the second frontal convolution, the centres where should be stored away the "memory," of the combination of motions necessary for the making of letters and words, the writing centre. The child recognizes more letters than she can make; but, as the child is unable to pronounce letters, it cannot be said how many letters she has learned to know by sight. After years of trial, she has succeeded in

learning to make a and b; the a is a capital letter, and she will leave out the mark that crosses the angle; and she often makes the b, which is also a capital, backwards; showing, it would seem, that the above-mentioned centres are badly damaged. Tell her to make c or d or e or f, or any of the letters of the alphabet, she will take the pencil in her hand; seems to understand what you want her to do; her fingers will move the pencil over the paper, and the result will be approximately an o; and after it is formed, and she sees it, often an expression comes on her face which seems plainly to say, "That is not right." The eyes recognize that the hand has failed to respond to the impulses sent to the writing centre from the sight-memory areas.

Thus, without going more into details just here, it would seem that although there is no paralysis of the muscles necessary for writing or speech, the brain centres, where normally are stored away the muscle memories of combinations necessary for writing and speech, are greatly injured. Nor does it seem likely that child will ever acquire the power of speech or writing, the damage to the centres being permanent.

There are one or two other points of interest in connection with the case. After the child's eyes had been fitted with glasses, and she had worn them a short while, the frequency of the choreic movements about the right eye, the mouth, and shoulders, diminished markedly. They have not, however, ceased entirely. This fact seems to show that in cases of congenital chorea, and it is fair to suppose that the same thing applies in cases of acquired chorea, the undue stimulation of the brain centers for eye muscles, which results necessarily when there is eye-strain due either to defects of refraction or lack of equilibrium of the external muscles of the eye, may reflexly increase the excitement in the areas whence the choreic movements have their origin, and hence augment the frequency of these choreic movements; and, in like manner, may, in cases of epilepsy, increase the number of attacks.

In an uncertain proportion of cases of epilepsy, chorea, and some other troubles, which the nature of this article does not

allow us to look into, the prime causes of the chorea or epilepsy may, of themselves, be sufficient to precipitate their peculiar convulsive movements only under certain conditions, and then with little frequency; reflexly, however, upon undue excitement in the arcs regulating the movements of the eye-muscles, there may result sufficient excitement to precipitate the attacks with increased frequency. Thus it has happened that cases of epilepsy, chorea, etc., have been reported as cured by relief of eye-strain due either to refractive conditions or to want of muscular equilibrium, whereas alleviation has been given only as regards the number of the attacks, which alleviation has been far more marked in some cases than others.

The further lesson from this observation is that in all cases of chorea or epilepsy the condition of the eyes should be carefully looked into, and any departure from the normal should be carefully corrected; and while I doubt the possibility of obtaining many permanent cures, in these diseases, by the correction of refractive errors, or the methods of partial tenotomies, great relief may be afforded to patients who may seek relief in vain from other sources. (So far from wishing to cast a slur upon the methods used for the restoration of the equilibrium of the eye-muscles by partial tenotomies, and the results obtained by them, in my opinion the introduction of the terms exophoria, esophoria, hyperphoria, etc., marks a period in the advance of our knowledge of the eyes, the greatest since the days of von Graefe). Further remarks upon this subject will be omitted for the present.

The prognosis in this case is bad, while continuous endeavors will be made to cause the patient to utilize the sounds over which she has control, in the pronunciation of the simple words in which they occur, there seems little hope that she will ever learn to talk or to write.—*Virginia Medical Monthly*.

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ORIGINAL ARTICLES.

A CASE OF METASTATIC, EXUDATIVE, NON-
PURULENT CHORIO-RETINITIS, WITH
COMPLICATIONS, FOLLOWING RE-
MITTENT FEVER.¹

CLINICAL HISTORY BY DAVID WEBSTER, M.D., NEW YORK.

MICROSCOPICAL EXAMINATION BY H. DAVISON SCHWARZSCHILD,
M.D., NEW YORK.

CLINICAL HISTORY.

Mr. Edward S. R., a literary gentleman whose home is in Brazil, came under my observation on May 30, 1890. He was a native of the United States, but had lived in Para for twelve years. He was depressed physically, by so long a residence in that warm, moist, enervating climate, and in October, 1889, he was attacked with remittent fever. The fever continued for some time and when he thought he was about well, he had a severe relapse. During this relapse he found he had to hold

¹Read before the New York Academy of Medicine, Ophthalmic Section, March 20, 1893.

his book further off when reading. One day a black speck appeared before his right eye. He tried to brush it away with his hand, and he opened and shut his eye repeatedly, in water, but he failed to get rid of the black speck. Within a week a film had crept over one-half the visual field, and it gradually extended until the whole eye was obscured. He went to a local physician and had his eye examined with the ophthalmoscope. The physician said "Oh! it is nothing," and gave him a hypodermic injection of pilocarpine. He told him to call the next day. He did so, but the doctor failed to keep the appointment. His fever was finally cured, however, by the use of quinine, but the vision was not restored.

Right eye sees objects but cannot count fingers.

Left eye, vision $\frac{20}{XX}$; $\frac{20}{XV}$ with -0.75 D. c. axis 180° .

The ophthalmoscope showed nearly total detachment of the retina of the right eye. There was no lesion of the media or fundus of the left eye.

I gave the gentleman some advice as to his habits and prescribed spectacles as follows:

Right eye opaque glass.

Left eye, $+1.50$ D. s. $\ominus +0.75$ D. c. axis 90° .

He returned to his home in Brazil. I did not see him again until Dec. 7, 1892, when he returned with a ripe cataract in his right eye, and no perception of light.

The vision of the left eye was $\frac{20}{XX}$ with 0.25 D. c. axis 180° .

Ophthalmoscopic examination showed a small area of dotted and stringy looking opacity of the posterior capsule of the left lens.

The patient stated that he had retained perception of light in his right eye until about a year ago; that is, until December, 1891. The cataract showed itself at about the same time. For the last month or six weeks he has experienced symptoms which caused him to be again anxious about his good eye. The blind eye has spells of feeling full or surcharged. It has a congested or suffused sensation, and at such times there is blurring of the fellow eye. The right eye is slightly, if at all,

injected, and there is no tenderness on pressure over the ciliary region. There is slight dilatation of the right pupil.

December 14, 1892. L. V. $\frac{20}{XXX}+$, $\frac{20}{XX}$ with -0.50 D. c. axis 180° .

It seemed probable that the opacity of the posterior capsule of the left lens was due to a low grade of inflammation of the uveal tract, and it was feared that sympathetic inflammation had developed.

The attacks of blurring of vision of the left eye seemed to look in that direction. I therefore advised the patient to have the useless blind eye taken out. To this he consented and I enucleated the globe on December 19, 1892, assisted by Dr. S. M. Payne and Mary E. Hennessy.

The eyeball was handed to Dr. Schwarzschild for macroscopic and microscopic examination.

July 10, 1893. Mr. R's eye has been steadily improving. The attacks of blurring no longer occur. He has returned to Brazil with an artificial eye replacing the removed one. I have since heard from him and he ceases to complain of his remaining organ of sight.

MICROSCOPICAL EXAMINATION.

The eye, delivered to me shortly after enucleation, was of large size, measuring 25 mm. in its antero-posterior and 24 1-2 mm. in its equatorial diameters; slight hypotonia; at the pupillary aperture was observed a well marked cataract apparently mature.

I placed the specimen in a fixing fluid where it remained five weeks; at the expiration of this period it was removed and divided, vertically in half.

Macroscopically; an exudation occupying the cavity of the globe consisting of super-imposed lamellæ of light flaky fibres of a yellowish color, totally devoid of tenacity. (See Fig.).

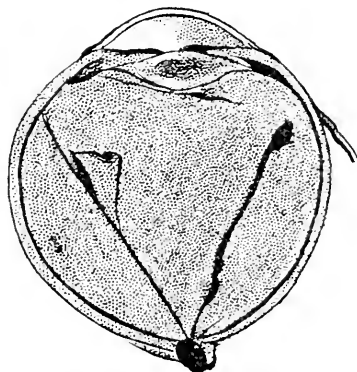
The retina is thickened and triangularly detached, the apex being the optic papilla and the base the ora serrata; it encloses and bounds the exudation internally. The left portion of the

drawing, in reality the superior, contains a smaller triangle caused by a partial loss of the mass. At the commencement of the ora serrata, inferiorly, there is seen a solution of continuity of the retina which is folded upon itself externally.

The lens is cataractous, the nucleus being more opaque than the cortex. The papilla is not perceptibly changed.

The cornea and sclera are neither thickened nor thinned.

The anterior chamber is of normal depth, and is partly filled by a light flocculent mass, less firmly embedded than that of the vitreous chamber; the pupillary aperture is round, clear and devoid of synechiæ. The posterior chamber is present and also occupied by exudation.



MAGNIFIED TWO DIAMETERS.

Pathological anatomy as observed by microscopical examination.—The exudative mass before mentioned is fibro-albuminous in character, containing in part normal and degenerated red blood corpuscles, principally the latter and exceedingly few leucocytes, in fact the number is so limited as to be devoid of significance. It is a uveal product caused by the alteration in the choroidal vessels; the retinal detachment and the laceration, *ruptura retinæ*, are caused by the pressure of the fluid. The retina is greatly altered, being nowhere normal; the various layers are distorted and changed. The fibre layer is considerably swollen throughout; the ganglion cells

though not as numerous as usual are, where present, increased in size. Those of the coarsely and finely granular layers are augmented in number. The supporting structure has become hyperplastic and the rods and cones are deformed through pressure. The separation of the various component structures is caused by a sero-fibrinous effusion which is found principally in the inter-granular layer; the appearance of this sacculation of the fluid, which is divided into sections by the fibres of Müller laterally, and the retinal elements internally and externally has given rise to the designation of cystic degeneration which is incorrect, as they do not possess a true cyst wall. The displacement is not uniform; in some places it is absent, in others more marked. The walls of the blood-vessels are atrophic and in portions they are perforated. Numerous small hæmorrhages exist in the fibre and inter-granular layers. At the point of rupture the retina is macerated, folded upon itself and increased to about 10 times its normal thickness, consisting here of a hypertrophic supporting tissue network, and the layers which are in a hopeless melee, are infiltrated by the sero-fibrinous effusion. The membrane is covered by the choroidal exudate and superficially permeated by it. The tissue change is that of an exudative retinitis in the stage of hypertrophy.

The choroid presents an abnormal appearance. The alteration in the walls of the vessels is marked. The chorio-capillaris is almost entirely obliterated; the medium-sized vessels of Sattler's layer are likewise diminished in number, the larger ones, Haller's, predominate. At the optic nerve entrance where the membrane is most normal, the walls of some of the vessels are thickened, others thinned. As we travel further they increase greatly in size, the veins disproportionately so with atrophy of their parietes, the rarefaction is in parts so extreme that an inter-vascular communication exists which predisposes to exudation, and in consequence the stroma is studded by small hæmorrhages. In places the entire width of the choroid is occupied by a dilated artery or vein; in other portions all that is seen is a strand of connective tissue with

its pigmented branches and non-pigmented cells. The retinal epithelium which varies in thickness is detached in parts; in some places only partly by serous exudation, in others completely separated and is seen in the sclera and in the mass which has replaced the vitreous; in both sites having undergone spontaneous proliferation. The lamina vitrea remains in situ even when the cells are detached; again in certain areas that also is absent leaving the choroid completely denuded. It is not adherent at all points to the sclera, being separated by exudation. The lesion is exudative, non-purulent, atrophic chorioiditis.

The optic nerve shows an increase in the number of nuclei in the connective tissue septa, demonstrating the presence of a moderate degree of interstitial neuritis. There are no effusions into the intervaginal space and no emboli in the arteria nor vena centralis retinæ.

The sclera, with the exception of localized fibro-albuminous infiltrations, is normal.

The crystalline is the seat of a capsulo-lenticular degeneration (*cataracta complicata*). The lens fibres are disintegrated and separated; the cortex is most affected, the nucleus being always the most resistant part. The interspaces are filled with a granular mass, coagulated fluid, in places this is formed into spheroidal bodies, the spheres of Morgagni. Immediately beneath the capsule are seen several small vacuoles, liquor Morgagni. The anterior capsule is intact; in the posterior one there is an alteration in the shape of the epithelium². The zonula of Zinn is permeated by uveal exudation.

The ciliary processes are slightly atrophied; they are in part deduded of the retinal pigment and cylindrical epithelial cells, the former having undergone proliferation. The process, inferiorly, nearest the lens is elongated, due to the shrinking of

²The posterior capsular epithelium, it is universally conceded, does not exist normally. In this case, however, I observed a double row of cells; a few were altered in shape, but the appearance of the remaining many convinced me that they were epithelial in character. Their contour was precisely the same as those lining the anterior capsule, with which they were directly continuous.

the exudate. The connective tissue stroma is increased in density and is infiltrated by exudation, the blood-vessels are partly obliterated and the walls of those that remain are thickened. The pathology shows the alteration to be analogous to that of the choroid, differing only in degree. There is a sclerosis of the walls of the iridal vessels, and a slight effusion is visible at the ciliary origin of the iris.

The lumen of Schlemm's canal, inferiorly, is partly occluded by true connective tissue; an exudation metamorphosis. The cornea is normal. ——— The posterior epithelium—endothelium—which forms the anterior cellular covering of the iris is absent at the sinus of the anterior chamber. I do not refer to the ciliary crypts. This deficiency commencing at the site of the canal of Schlemm and extending about 2 mm. along the surface of the membrane.

The posterior chamber contains an exudation similar to that occupying the cavity of the globe. That of the anterior one is decidedly more albuminous in character and does not contain any normal and but few degenerated blood cells. It is derived from three sources: (1) the canal of Schlemm; (2) the iris at its ciliary origin; (3) the corpus ciliare passing through the spaces of Fontana in the ligamentum pectinatum.

A small non-plastic exudation is not perceptible in the recent state and coagulates only through the chemical action of reagents.

The pathological conditions mentioned and described demonstrate that the choroid and the retina are the membranes most affected; the ciliary and incipient iris changes observed are secondary to the chorioiditis, the cataracta complicata is dependent upon deficient nutrition.

The exciting cause of the inflammation described is stated by Dr. Webster in the clinical history to be remittent fever. In this condition there are no emboli to create suppuration, there is, however, a hæmic change, and the vascular walls not being sufficiently nourished undergo retrogression.

The choroid was the first to become diseased, then the retina, which, although possessing a vascular system of its own, de-

pend upon the chorio-capillaris for its nourishment; the retinal vessels being situated in the inner layers only.

Interstitial optic neuritis is caused by acute febrile disease (Fuchs). The diagnosis of the lesion is therefore metastatic, exudative chorio-retinitis with complications following remittent fever.

The sympathetic inflammation in the other eye was caused by the traction of the exudate upon the ciliary processes.

This sequela being the cause of the enucleation of the diseased eye, a few words regarding the lesion are in order. The theories of Taignat, who considered sympathetic ophthalmia a neuralgia; of H. Müller and others who regarded it as a reflex neurosis, are well known. The more recent experiments of Deutschmann, who introduced cultures of the staphylococcus into the vaginal sheath, and thereby not only caused an optic neuritis on the other side, but also a general infection of the animals operated upon, are accepted by some as conclusive. When we consider, however, that in many cases of iridocyclitis optic neuritis is not present, and that the lesion of the sympathizing eye invariably involves the ciliary region, it can hardly be considered probable that the optic nerve sheath should be the medium of transmission. The absence of a small cell infiltration in any part of the eye examined at once negatives the bacterial theory.

The case is unique for several reasons. The iridocyclitis in the exciting eye though of mild character and non-traumatic origin, was still empowered to create sympathetic trouble in its fellow organ. The theory of Mauthner, viz.: that when sympathetic inflammation has once developed, the removing of the exciting eye is of no avail, is refuted in this case; the sympathizing one advancing to recovery.

In default of proof to the contrary, I concur in the opinion of the other writers, that sympathetic ophthalmia is a neurosis of reflex origin.

FURTHER HISTORY OF A CASE OF MALIGNANT FIBROID OF THE ORBIT.

BY JOHN DUNN, M.D., RICHMOND, VA.

In the American Journal of Ophthalmology for December 1890, I reported a case of Malignant Fibroid of the Orbit; interesting because of the age of the patient, a negro, 19; because of its rapid growth, and because its chief structural elements consisted of fibrous tissue—although the eyeball was not attached, it was enucleated that the tumor might, if possible, be removed in its entirety. The negro disappeared from the clinic before the wound, left from the operation, healed. On December 26th, 1891, I was on one of the river steamers and saw among the hands this negro. The surface of the wound had healed and although there had been much retraction in healing, owing to the fact that a part of the lower lid had been removed with the tumor, the orbit appears to be in a fairly good condition, and there was nothing that suggested an early return of the growth. On January 21st 1892 the negro appeared at the clinic with a growth which, when removed was about the size of a lemon, protruding from the orbit. He had, the latter part of December, shipped before the mast on one of the small coast schooners. Early in January the tumor had reappeared; the weather had been cold and stormy, and they had had no fire on the schooner. The growth had made rapid strides. The surface of the growth was not ulcerated as it had been before; but, although red on the surface, was encapsulated. It filled the whole orbit so as to be immovable in it. It sprung from the whole length of the lower lid involving the inner canthus. The upper lid was not involved. The growth protruded from between the lids, which were greatly stretched,

the skin over them being tense. Under chloroform the tumor was removed, the fact that it was for the most part covered with a firm capsule rendered its removal much easier than it might otherwise have been. Strong fibrous bands connected the capsule with the periosteum of the orbit above and below, especially just within the orbital border. By removing part of the upper lid and the whole of the lower lid, and with the aid of hooks and a pair of scissors the tumor was cleared everywhere except posteriorly where its adhesions were firm and strong so as to serve as a pedicle to the tumor, the pedicle as far as I could tell extending back into the sphenoid fossa. The pedicle was cut as far back as possible and everything suggesting a remnant of the growth was removed from the orbit. The periosteum was stripped in a great measure from the orbital plate of the frontal bone and also in part from the orbital plates of the superior maxillary and, perhaps, also of the sphenoid. The negro returned to have the wound dressed, three or four times and then disappeared. While enucleating the tumor, in an endeavor to get my finger around one of the bands which bound it to the orbital wall, my finger went through the sac of the tumor into what proved to be a cyst whose contents were a pulpy tissue filled with a thick juice. The growth had become a fibro-cystic sarcoma. The tumor was sent to Dr. Wm. M. Gray of the Army Medical Museum at Washington. His report at the nature of the growth was as follows:

"Small and Large Round Cell, Giant Cell Sarcoma.—This growth is composed of round cells of various sizes; the larger cells have a very close resemblance to epithelial cells; in number the smaller cells predominate. Scattered through the cell mass are numerous typical giant cells, also some large round or irregular shaped cells, with multiple nuclei, which have not the characteristic appearance of giant cells, being almost entirely lacking in cell protoplasm. There is very little intercellular tissue in the growth, no distinctly formed fibrous intercellular tissue; the cells seem to be connected by a finely granular material.

The growth is quite vascular, some of the blood vessels have distinct fibrous walls, others are mere channels between the cells."

On July 25th, 1892, the negro reappeared at the clinic, complaining of his inability to sleep on account of "pain in his right eye." The tumor had again grown and was beginning to bulge forward the skin of the upper lid, which now served as a covering for the orbit; for the upper lid had now grown to the lower margin of the orbit, the lower lid having been removed at the time of the last operation. Under chloroform, an incision was made from above the upper eyelid near the middle line of the face down to the inner lower margin of the orbit, across the orbit and then up across the temple for about three-fourths of an inch. The skin was then laid back as far as the supra-orbital ridge. An endeavor was then made to remove the growth from the orbit. When, after considerable difficulty and excessive bleeding, the orbit had been cleaned of all tissue as far as deemed advisable, it was seen that the grave attempt to eradicate the growth in its entirety had failed, for as far as could be made out, it has passed down behind the superior maxillary bone; it had passed through the sphenoid fissure; it had grown into the sphenoid fossa; it had sent its prolongations through the sutures, the boundaries of the ethmoid plate; *it had chosen as its points of origin all the areas of bone from which the periosteum had been stripped in the former endeavor to eradicate the growth*, and in the endeavors to remove the growth small plates of bone were torn from these places, and others could be separated from the bony plates with the finger nail.

As on the previous occasions, so on this, the negro returned only two or three times to have the wound dressed. On Dec. 9th, 1892, however, he appeared again at the clinic, saying that the tumor, after remaining quiet until the first of November, 3 months, began again to grow. His condition now was pitiable. A huge fungus was protruded from the orbit, into the margin of which the growth had sent its roots, infiltrating the skin adjacent to the orbit. The negro was suffering in-

tense pain and, although I knew anything like a complete removal was impossible, I determined to again clean out the orbit, thinking that if the negro survived the operation, it might relieve the pain temporarily and, perhaps, retard the growth for awhile. Accordingly an oval incision was made, surrounding the orbit, after which the grosser contents of the orbit were enucleated. The operation was most unsatisfactory, owing to the excessive bleeding. The tumor had now become exceedingly soft, almost like mush, and was filled with blood channels. The lower floor of the orbit was virtually all destroyed. No careful examination was made of the condition of the other walls of the orbit. Enough was seen, however, to show that the tumor had prolonged itself in all directions, especially into the sphenoid fossa. The orbit was packed with bi-chloride cotton, over which a compress was put. The negro slept well, and next day went home. The dressings were removed on the second day, when it was found that a great quantity of mucus from the nose was in the orbit, showing that the ethmoid plate had been partly destroyed. From this time on the growth increased with great rapidity, until at the end of two weeks the orbit was again filled with it, and it was beginning to protrude beyond its boundaries. Injections of pyoktanin were made into the body of the growth. These, however, had no effect in retarding the growth of the tumor.

Feb. 18th. The patient died to-day. The increase in the size of the tumor since Jan. 15th, has been little short of marvelous. It protrudes from the left orbital region like some huge knobbed fungus; it projects over the bridge of the nose so as to partly occlude the other eye; it has filled the antrum and the nose. The superficial width of the growth is 6 inches. Its thickness, measured from a plane tangent to the orbit, is about 4 inches. The negro, who, two months ago, was the picture of bodily strength, has rapidly emaciated. His skin, especially about the lips and palms of the hands, has assumed that dirty yellow color, characteristic of extreme *anæmia* in the full blooded negro. The pain from the growth does not

appear to have been very severe since the patient's strength began to fail. No autopsy could be obtained.

The horrid picture presented by this history suggests two questions. Is there no way to prevent the recurrence of these growths after the first operation? Why do not the growths reappear immediately after operation, but seem to have a period during which they are preparing themselves for a change of structure and a more rapid growth? This tumor became less and less solid after each recurrence, until at the time of the last operation it seemed to be chiefly a mass of large intercommunicating blood channels. During its last growth its capacity for bleeding under the slightest injury became so great that manipulation was impossible. Copious bleeding would follow the jab of a fine hypodermic needle. At the time of the operation in this case, the eye, although perfectly healthy, was removed with the tumor, in hopes that the eradication of the tumor might be complete. It failed, and just here the suggestion comes in that possibly had the area of origin of the tumor, at its first appearance after the operation for removal, been thoroughly cauterized with the galvano-cautery, and this repeated two or three times if necessary, after the burnt area had healed, it might have succeeded in preventing a recurrence of the growth. It will certainly be given a trial should a similar case present itself in the future. The negro disappeared, however, too soon after the removal for this to be tried this time.

CORRESPONDENCE.

OPHTHALMOMETRY IN THE UNITED STATES AND ITS CHAMPIONSHIP.

EDITOR AMERICAN JOURNAL OF OPHTHALMOLOGY:

SIR.—In your Journal of January of this year there appeared a communication from Dr. Swan M. Burnett, in answer to a letter from me published in the *New York Medical Journal* for September 24th, 1892. In this article Dr. Burnett charges me with having made “many misstatements and misrepresentations” in my letter. Certainly this requires an answer from me. I ask, therefore, Mr. Editor, an opportunity to be heard in reply.

My youth seems to have been a matter of reproach on the part of Dr. Burnett, but I think you will agree with me that the subject which we are discussing is one in which personal contentions have no place. At the very outset, allow me to say that I believe I shall be able to show that whatever may have been the case with Dr. Burnett’s statements, that I have not been guilty, as he thinks, of any misrepresentation. If it can be shown that I have been it is unwitting, and I shall take great pleasure in making a proper correction.

First—Dr. Burnett creates a wrong impression when he says “It must be admitted, however, that Dr. Davis now, for the first time, concedes priority of first description and first use of the ophthalmometer to the Barbarian outside the walls, etc.” In saying “for the first time,” he implies that I have written more than once concerning the championship of ophthalmology. This is not the case; I have written but once on the subject of the *championship*. However, the first and only

letter seems to have demonstrated the fact, Dr. Burnett to the contrary, that the championship of ophthalmometry in America is a matter of a very great deal of concern to some other oculists, besides a certain set in New York; that is, if we are to judge from the number, the celerity and vehemence of the replies to this letter of mine. This letter, I wish to say, although Dr. Burnett has seen fit, with what seems to me questionable taste, to make somewhat unpleasant allusions to Dr. Roosa in his reply was, like that of Dr. Hunter for Dr. Noyes, written of my own free will and suggestion, to attempt to do justice to one of my teachers and friends.

I regard the following as a misstatement also. Dr. Burnett says: "I do not allude to the attempt to associate in the same category Dr. Landolt, who is not an advocate or a friend of the instrument, and myself, who am both, by garbled extracts from our writings." It seems as if Dr. Burnett has two ways of looking at a quotation, depending wholly upon the fact whether the quotation is made in his favor or against him. The quotation from Landolt in my letter was taken *verbatim et literatim* from an abstract of a paper by Dr. F. B. Eaton, published in the *Medical Record* for November 12, 1893. If Dr. Burnett claims it to be a garbled quotation, Dr. Eaton is the responsible party. But Dr. Eaton used this very quotation, word for word, to show wherein Dr. Landolt was incorrect in his opinion concerning the ophthalmometer. This is shown by his comment quoted by me. It is not used to show its great similarity, in word and thought, to a certain full paragraph quotation from "le premier champion" (Javal). Dr. Eaton was spared a public censure for "garbled quotations." After all, it does make a difference whether a quotation is in our favor or against us. So much for Dr. Eaton's quotation from Landolt.

Now as to the quotation from the *Treatise on Astigmatism*, to which Landolt's was compared. All I have to say is, I quoted a full paragraph of a dozen lines (in no way marring the sense) which for a short letter was quite sufficient, for it fully presented Dr. Burnett's views on this point. Dr. Burnett continues:

"But when he (Dr. Davis) goes on further and says that in fact Burnett, in his first paper on ophthalmometry, gave drawings made from measurements of the cornea by the disc of Placido, in some respects he claimed it to be superior to the ophthalmometer, the long suffering of the Barbarian even must give way. I will quote, Mr. Editor, exactly what I did say, and what can be found on page 171 of that paper: "No other form of keratoscopy can be compared to it (the ophthalmometer) for precision and accuracy. I have used Placido's disc and Wecker's squares, and must confess that I found them worthless in regular astigmatism. The statement of Dr. Davis is wholly the product of his fertile imagination."

I make this rather long quotation so as to present clearly the statements to the reader, and, incidentally, so as not to be charged with "garbling." Dr. Burnett's misstatement here is the assertion that the statement of Dr. Davis is wholly the product of his fertile imagination." The misrepresentation consists in the fact that Dr. Burnett garbled from his own paper, and did not quote sufficiently from that paper what he did say about the disc of Placido, to show his true position.

Part of my statement was that Dr. Burnett "gave drawings made from measurements of the cornea by the disc of Placido." This he admits on page 5 of his letter, to-wit: "The measurements of the ophthalmometer, which furnished a clue to the *regular* (italics mine) astigmatism associated with it (a case of keratoconus) are given, however, with laudatory praises of the instrument without the *aid* (italics mine) of which it could not have been done." However, had he not have admitted it here, he did so on page 174 of his first paper. ⁽¹⁾ "As we always have a certain and usually a very large amount of irregular astigmatism in kerato-conus, I made careful measurements of both eyes of Mrs. R. with the disc (Placido's, of course)." Part of my statement, therefore, I show, by his own words, is not *wholly* the product of my imagination.

Now for the other part of my statement: "in some respects

¹Archives of Ophthalmology, 1885, vol IV, Nos. 2 and 3, page 174.

he claimed it to be superior to the ophthalmometer." I still say so. He virtually and actually admits the fact in the quotation from page 5 of his present letter, just made above. He says the ophthalmometer gave him a clue to the regular astigmatism. But how about the *irregular* astigmatism? Why, the disc of Placido pointed it out to him, of course. The ophthalmometer was an *aid*. Something must have been of prior or superior importance to it then in measuring irregular astigmatism and in making keratoscopic drawings, or why was it only used as an aid? That something in this case was the disc of Placido. In this letter, however, is not the only place Dr. Burnett has committed himself on the superior value of the disc of Placido. For, if Dr. Burnett had continued to read his first paper (²) from page 171 to page 173, he would have found the following quotation from himself, and would not then have attributed to my imagination the credit for that which he himself had written: "Javal has added a Placido's disc to his instrument since 1881, and it has increased its value very much for the determination of *irregular* (italics his) astigmatism. I had found the disc of Placido very useful for this purpose, and by it have discovered varying degrees of irregular astigmatism in many cases where V could not be brought up to " ∞ "₂₀ by any optical means." So it would seem again "in *some* respects," the disc of Placido is superior to the ophthalmometer (no question whatever so far as the "old model" is concerned).

Now I am sorry I did not put that little word *some* "in italics, in red ink," and a red candle at each side of it. It would have saved Dr. Burnett a serious blunder in his statement. But a very patent fact—one requiring neither italics, red ink, nor capital letters, for that—brought out by the quotations from Dr. Burnett in this letter concerning the disc of Placido, and in my first letter concerning the ophthalmometer is, that Dr. Burnett having at one place in his writings spoken very lightly of either of these instruments is no indication whatever that he has not in another place (sometimes in adjoining paragraphs), spoken disparagingly of them.

²Already referred to in the Archives of Ophthalmology.

Dr. Burneet objects to enthusiasm, but I beg here to present what was said by Dr. D. Schweinitz in his paper, that brought out my letter which Dr. Burnett has so severely criticized, in regard to my description of the method of using the ophthalmometer. "The most recent communications on the subject in this country are the papers of Dr. Davis, containing as it seems to me, the best practical directions for using the instrument accurately." This is irritating enthusiasm, no doubt, to a man who has labored so long and written so much about the ophthalmometer, to have "the ophthalmological youth" credited with the best description of the instrument.

I must confess also that I like a man who has the courage of his convictions, and whose language is sufficiently enthusiastic in only one direction, to at least place him on one side or the other of the fence, and not on top of it. It is "faint praise" indeed to go to both extremes. And when he says on page 3 of his letter that he has been in the habit of "always speaking of it (the ophthalmometer) in great praise," I beg to differ. His praise, great or faint, failed to give the profession of this country any adequate idea of the value of the instrument. We have admitted and quoted him to the effect that he has sometimes lauded the ophthalmometer, but not always, as is shown by comparing a certain quotation from his book to a similar one from Dr. Landolt's, which he does not seem to like at all. I think the straight dart of enthusiasm struck this "boomerang" of both extremes about mid-ship.

Dr. Burnett also thinks there is an implied slur in the following paragraph in my letter: "Dr. Roosa took a discredited instrument and brought it into wide use and good repute," and asks, "who brought it into discredit?" It *was* in discredit in 1888, because it was known only as a subsidiary means of diagnosis or not at all. The truth of this statement I will substantiate by no less an authority than the distinguished discoverer of anæsthesia by cocaine, Dr. Koller, to whom Dr. Burnett has already so justly referred to as pursuing the middle ground of truth. Dr. Koller (³) even so late as 1890, has

this to say: "When two years ago (1888) I came to this country, which is so ready to adopt new and good methods, I found the ophthalmometer comparatively unknown." This is unbiased evidence, Mr. Editor. This country which is so ready to adopt new and good methods, *when* known, are equally ready to discredit methods that remain comparatively unknown long after their invention. Such was the state of facts in 1888. Though the instrument had been used for more than three years by Drs. Burnett and Noyes, it was given only secondary importance and was comparatively unknown, and, therefore, discredited. The truth may hurt, Mr. Editor, but it can not slur.

As to the difference between the "old" and the "new" model instruments. I am aware of the fact that the cardinal points of the old and new models are similar, and that theoretically, a description of the "old" will answer for the "new," for men who *already* understand both models. But, if everybody already understood both models, what would be the use of a description at all? Practically then, for teaching men who do not *already* understand both models, the description of the old model to apply to the new model is a poor one, and essentially bad. I think that beginners will bear me out in this statement.

Lastly—the champion. Though cognizant of the fact, when writing my first letter, that Dr. Javal had designated Dr. Burnett "le premier champion," owing to the qualification "le premier," which I took to be a chronological qualification, I let it go by. But when Dr. de Schweinitz unqualifiedly designated him champion, implying not only priority, but the man who had done most to bring the instrument into practical use, as the one who had actually championed it, I thought it time to point to another man, Dr. Roosa, who had caused more ophthalmometers to be bought and used and had done more by his *practical* teaching to popularize the instrument than any one man, or any six men, in America. But mere statements amount to nothing unless they can be proven. And now the proof.

For three years or more the instrument was talked about in some societies by those who introduced it, and at the end of that time, in 1888, by distinguished authority, it was declared to be comparatively unknown. And, what is more, it was unused, except by a very limited few: a statement which I made in my letter to the *New York Medical Journal*. This assertion was not even questioned, let alone denied, by either Dr. Hunter or Dr. Burnett. This demonstrates to the profession that the ophthalmometer was not popularized, in fact, hardly heard of, in America so late as 1888. Until the Autumn of 1892, ophthalmometers could only be obtained in this country by importation. Through Dr. Roosa's efforts, continued for a year, Messrs. Georger & Halin first, and Meyrowitz Brothers second, in New York, manufactured and sold more than sixty instruments, exactly as perfect as those made in Paris. Dr. Roosa believed, as soon as he knew the value of the ophthalmometer, and this belief I share, that no oculist ought to prescribe for errors of refraction without the aid of an ophthalmometer. Did Dr. Burnett, or any other champion, ever indicate or act upon such a belief as this? Why was it that from 1885 to 1889 the value of the ophthalmometer was unknown except to a very few? In my final paragraphs I think I shall show that Dr. Burnett does not, even to this day, know its full value. In 1889 Dr. Roosa placed an instrument in the Manhattan Eye and Ear Hospital (to which another has been added since, also to the Post-Graduate school, through my influence) and he began to demonstrate the use and practicability of the instrument in the clinic-room the year round, to large classes of practitioners. These men were placed in possession of the instrument and taught to use it. Although Dr. Roosa had used this instrument in his private practice for a year before this, he does not consider that he began to make its use known until he did so in his class-rooms. I do not consider any allusions to it, that may have been made in a college a mile away from an ophthalmometer and consequently without a demonstration, as of any practical value in making this instrument known, or as any championship. Until Dr. Roosa's work, its

use was taught in this way only in New York. Not a single medical college, or ophthalmic institution taught its use. His teaching was practical. The number of ophthalmometers sold since 1889 show that it was popular. While, without question, the influence of other writers in America has helped to bring the instrument into esteem and actual use, yet by the influence of one man more than any other, it has been popularized.

The championship in my opinion depends upon an advocacy that has never ceased, upon work and results from it, and not upon the fact that a certain writer was the first in America to describe an ophthalmometer.

The same year (1887) that Dr. Burnett (⁴) treated on astigmatism the "Reference Hand Book of Medical Science" contained a description of the ophthalmometer with a picture of it. Article, Optometry, by Dr. John Green. Dr. Burnett is not mentioned in this article.

Dr. Green thus divides with Dr. Burnett, the honor of giving what Dr. Burnett believes to be "the first description of the instrument in English."

Dr. Burnett, however, seems to think I set forth the real claim to a championship in the closing paragraph of my letter where I state that Dr. Roosa demonstrated its (the ophthalmometer) great practicability, not only in cases of aphakia, *but in all cases of refraction.*" He remarks also upon the italics. If Dr. Roosa's claim to the championship was not already, as I believe, established by the foregoing evidence, I should be perfectly willing to let it rest on the closing paragraph of my letter. Furthermore, Mr. Editor, to use Dr. Burnett's style, I am sorry those italics were not in red ink, or capitals with stripes on them. They would not have been, even then, too plainly set forth for the intelligent comprehension of one of my readers. He is obtuse, indeed, who cannot appreciate the value of the ophthalmometer *in all cases of refraction.* True science has a *negative* as well as a positive side, a fact well known to

⁴Wm. Wood & Co.

many who have no knowledge of physiological optics and know nothing of the ophthalmometer. In general medicine, for instance, by exclusion (a negative procedure) a diagnosis is often arrived at that could not possibly have been attained otherwise. So with the ophthalmometer. It is of value, negative or positive, in every case of refraction, and I never fail to make use of it. In those cases where there is corneal astigmatism it discovers it. In those cases where there is no corneal astigmatism—in hyperopia, myopia and lenticular astigmatism—it excludes it. A matter, by the way, of a very great deal of importance to those who value time, and who wish to know for certain if or if not corneal astigmatism is present. The instrument is, therefore, of great value, even in simple cases of hyperopia and myopia, by the mere fact of its excluding corneal astigmatism.

Dr. Burnett does not understand the point of our contention. I gave him the credit for having first in America described and praised the ophthalmometer. But he made so many exceptions to its value, he took such pains to expressly state "that no method should be relied on exclusively; and no diagnosis of astigmatism should be considered as fixed until it has been verified by an examination with cylindrical glasses and test types (⁵) that his words made very little impression on the oculists of this country.

It is indeed extraordinary that Dr. Burnett has not long since found my statements to be truisms in regard to the great value of the ophthalmometer in "all cases of refraction." As Dr. Roosa has taught in his papers if the presence or absence of corneal astigmatism be once established, with its degree, if present, all necessity for the use of atropia or similar agents is at once done away with. Except in very rare cases, the degree of hyperopia or myopia can easily be learned without a mydriatic, and we are ready at once to prescribe glasses.

If Dr. Burnett has used the ophthalmometer for eight years without learning this, he has missed the whole point of its

⁵Treatise on Astigmatism, page 136.

value. It is easy to see from his writings that he has done so, and that he has been a champion, if at all, of an instrument, the full value of which he never understood. To use the ophthalmometer and then to resort to atropia or homatropine or retinoscopy or Placido's disc, is to show that we regard its value far below that accorded to it by Helmholtz and Javal and Schiötz and G. J. Bull of Paris, and by those who have brought it into general use in our country.

In the light of Dr. Burnett's confessed ignorance of the real value of Javal's instrument, far beyond its capacity to determine the presence of astigmatism, in all cases of refraction, not directly, of course, but indirectly, and in consequence of exact determination of the presence or absence of the most important of all errors, I can afford to pass by in silence, his sarcasm and merriment upon the knowledge of physiological optics, thought to be possessed by Dr. Roosa and myself, and his sneer at the "ophthalmological youth."

I am constrained to believe, in spite of his merriment, that a pilgrimage to New York, where the use and value of the ophthalmometer are properly and fully taught, would increase his knowledge, and possibly cause him to be temperate and courteous in discussion with a fellow member of a learned profession.

A. EDWARD DAVIS, M. D.

NEW YORK, March 18, 1893.

OPHTHALMOMETRY IN AMERICA.

EDITOR AMERICAN JOURNAL OF OPHTHALMOLOGY:

DEAR SIR.—There is nothing in Dr. Davis' long letter in this issue which has not, I think, been fully met in my communication in the number for January. At least I am content with the statement of the facts, and am sure the profession have had more than a sufficiency of this ophthalmometry farce.

There is one person, however, who is entitled to a hearing on all things pertaining to the practice or history of ophthalmometry and that is the genial gentleman to whose ingenuity and patient labor we are indebted for the instrument. The following letter from Dr. Javal, which he has asked to have published, was written by him before he had any knowledge that I intended to reply to Dr. Davis' communication, and is his free will offering towards a settlement of the question. Here is a translation of the letter:

[TRANSLATION.]

51 RUE DE GRENELLE, PARIS, 24 2, '93.

MY DEAR COLLEAGUE.—An unknown friend has sent me a copy of the *New York Medical Journal* of 24th of December last, containing a letter from Dr. A. E. Davis on ophthalmometry in America. The object of that letter is the establishment of Dr. St. John Roosa as the "champion" of ophthalmometry in your country.

I recognize the obligations we are under to Dr. Roosa for his encomiums on the ophthalmometer and I have the highest regard for his recent publications on the subject of refraction, but it appears to me that Dr. Davis fails utterly by his misconception of the part you have played, and for this reason his letter has given me great chagrin.

Since 1883 you have pointed out the usefulness of the ophthalmometer, and you have never withheld your advocacy of it when ever any opportunity offered. I believe that your articles, so thorough and yet so moderate in tone, have been largely instrumental in extending the use of an instrument which is now more popularized in your country than in Europe. When you deemed the cause of ophthalmometry firmly established you gave your attention to other subjects without attempting to surround your name with an atmosphere of humbuggery. It is for this reason that I cannot let Dr. Davis's letter go by without extending to you my renewed thanks and cordial sympathy.

DR. JAVAL.

I think, in the interest of ophthalmometry, it should be known, and I have Dr. Javal's authority for the statement, that the only ophthalmometers to be had in this country which have been verified by Dr. Javal himself are those on sale by Borsch in Philadelphia. It should also be added that the price of these instruments now, in spite of "le Bill McKinley," is not above those of equal goods—if there be any—which are manufactured or constructed in this country.

With thanks for your courtesy I am yours very truly,

SWAN M. BURNETT.

SOCIETY PROCEEDINGS.

XITH INTERNATIONAL CONGRESS OF MEDICINE
TO BE HELD AT ROME, SEPTEMBER 24
TO OCTOBER 1, 1893.

The Secretary General of the International Congress, Prof. E. Maragliano, is anxious to have the medical profession of this country thoroughly represented at the meeting in Rome. So that all physicians who anticipate going may be familiar with the details of this great meeting, we give here a complete

outline and synopsis of it. Those who intend to participate in the Congress should communicate with the American national committee through its chairman, Dr. A. Jacobi, 110 West 34th street, New York. Application should be made at an early date. The admission fee of \$5 may be sent to the treasurer, Dr. L. Paglionia, Rome, Italy, or Dr. Jacobi, who has kindly offered to forward any applications or fees sent to him.

The inauguration of the Eleventh International Congress will take place the 24th of September, 1893, in the presence of H. M. the King of Italy.

The work of the Congress will begin in the nineteen sections on the morning of the 25th of September. It will be continued in accordance with the arrangements to be made and published both for the general sessions and the sections. Some of the general sessions will be devoted to scientific addresses delivered by scientists of all nations.

LIST OF THE SERIES.

1. Anatomy.
2. Physiology.
3. General Pathology and Pathological Anatomy.
4. Pharmacology.
5. Internal Medicine.
6. Diseases of Children.
7. Psychiatry, Neuropathology and Criminal Anthropology.
8. Surgery and Orthopedy.
9. Obstetrics and Gynæcology.
10. Laryngology.
11. Otology.
12. Ophthalmology.
13. Odontology.
14. Military Medicine and Surgery.
15. Hygiene.
16. Sanitary Engineering.
17. Dermatology and Syphilidology.
18. Forensic Medicine.
19. Hydrology and Climatology.

REGULATIONS.

1. The Eleventh International Congress of Medicine will be inaugurated in Rome on the 24th of September, 1893, and will close on the 1st of October.

2. Any physician may become an active member of the Congress by fulfilling the conditions of membership, inscribing his name, and securing his admission ticket.

3. Scientists of other professions who, through their special studies, are interested in the labors of the Congress, may acquire the rights and assume the duties of active members, and participate in the work of the Congress, both by communications and discussions.

4. The fee for admission to the Congress is twenty-five francs or \$5. It entitles to a copy of the Transactions of the Congress, which will be forwarded to the members immediately after publication.

5. The character of the Congress is strictly and exclusively scientific.

6. The work of the Congress will be divided amongst nineteen sections; every member is requested to indicate, on paying his admission fee, the section for which he desires to be inscribed.

7. The provisional committee will arrange the appointment, in the opening session, of the permanent officers. There will be a president, three vice-presidents, a number of honorary presidents and secretaries. Each section will elect, in its first meeting, its president and a certain number of honorary presidents, who shall alternately take the chair during the session. Some of the secretaries will be chosen from among the foreign members in order to facilitate the recording both of communications and of discussions in the different languages.

8. There will be daily sessions, either general or sectional. The times and numbers of the general sessions, and the business to be transacted in them will be arranged by the president of the Congress.

9. The general sessions are reserved (a) for the consideration of the common work of the Congress and of its common

interests; (b) for addresses and communications of general interest and importance.

10. The addresses in the general sessions, and in such extraordinary sessions as may be arranged, will be delivered by the members chosen by the committee for the purpose.

11. Papers for and communications to the Congress must be announced on or before June 30, 1893. A brief abstract of every paper and communication, with their conclusions, must be sent to the committee on or before July 31. All of them will be printed and distributed to the members by authority of the president. Such as arrive after that date cannot be expected to find a place on the regular order of business, and will be accepted only if time will permit.

12. The business of the sections will be arranged by their presidents, who will also determine the hours of meeting, avoiding those reserved for the general sessions. Two or more sections may hold joint meetings with the consent of their presidents. There will be no vote upon scientific questions.

13. Fifteen minutes will be allowed for the reading of a paper or communication. In the discussion every speaker can have the floor but once, and for five minutes only. To close the discussion the author of the paper is allowed ten minutes. Additional time may be given him by the president, by special resolution of the section, if the importance of the subject under discussion appears to require it.

14. The manuscript of all addresses, papers and communications read either before a general session or a section must be handed to the secretary before the close of the meeting. A special committee on publication appointed by the president will decide which or what part of them shall be published in the Transactions of the Congress. Such members as participated in the discussions are required to hand to the secretaries their remarks in writing.

15. The official languages of the sessions are, Italian, French, English and German. The regulations, programmes and daily bulletins will be published in the above four languages. During the meetings, however, a member may be permitted to

use, for a brief remark, any other language provided some member present expresses his willingness to translate such remarks into any of the official languages.

16. The president directs the discussions according to the parliamentary rules generally obeyed in similar assemblies.

17. Persons not classified under Article 3, who are interested in the labors of a special section, may be admitted by the president of the Congress. They will receive a special ticket on paying their admission fee; will not be entitled to a copy of the Transactions, and cannot speak in the general sessions nor in any section other than that for which they were inscribed.

18. The president may invite or admit students of medicine to attend and to listen. They will be given a special admission ticket, free of charge.

GENERAL INFORMATION.

JOURNEYS AND REDUCTION OF FARES.—The provisional committee has made arrangements with the different Italian and foreign railway and navigation companies, in pursuance whereof special reduced prices have been granted on the steamers and railways of this country and of the countries which the members of the Congress are to traverse.

In Italy the members of Congress will find tickets for round trips, starting from Rome; they will thereby be entitled to visit the most important cities and the various universities. In regard to this further notice will be given.

THE LADIES OF THE MEMBERS will be furnished ladies' tickets, which will entitle them to the reduced fares granted to the members, and to participate in the festivities connected with the Congress.

FESTIVITIES.—Besides the receptions which the kind and hospitable citizens of Rome will offer to the members, the Italian colleagues will endeavor to return to the best of their power the kindness they experienced during their stay abroad.

On some evening yet to be decided, the members of the different sections will join at a dinner which will be given in one of the first hotels of Rome.

The Italian physicians have formed special committees to show the most hearty and kindly hospitality towards the foreign colleagues.

INTERNATIONAL EXHIBITION OF MEDICINE AND HYGIENE.—On the occasion of the Eleventh International Medical Congress, and exhibition of Medicine and Hygiene will be inaugurated in Rome, which will gather all that may practically interest physicians and specialists. A special committee has already insured the co operation of all the most important manufacturers of the world.

HOTELS.—All the first and second-class hotels of the Italian capital will afford to members, during their stay, all desirable comforts.

NEW BY-LAWS PAN-AMERICAN MEDICAL CONGRESS.

LANGUAGES.—BY-LAW IX: Papers may be read in any language providing that authors of the same shall furnish the Secretary-general with an abstract not exceeding six hundred words in length in either of the official languages (English, Spanish, French or Portuguese), by not later than July 10th, 1893, and providing, further, that a copy of each such paper shall be furnished in either of the official languages at or before the time of meeting to the secretary of the section before which the same shall be read. Remarks upon papers may be made in any language providing that members making such remarks shall furnish a copy of same in either of the official languages before the adjournment of the session.

PUBLICATION.—BY-LAW X: All papers read either in full or by title shall be immediately submitted for publication in the Transactions (special regulation 3) but authors may retain copies and publish the same at their pleasure after the adjournment of the Congress.

CONSTITUENT ORGANIZATIONS.—BY-LAW XI: All medical, dental and pharmaceutical organizations, the titles of which

have been transmitted with approval to the committee on Organization, or which may hereafter be transmitted with approval to the executive committee by any member of the International Executive Committee, each for his own country, shall be subject to election by the executive committee, approved by the president, as constituent bodies of the First Pan-American Medical Congress, and each organization thus constituted shall have the right to designate as delegates all of its members attending the Congress, but no such organization shall meet at the time and place of meeting of the Congress as a distinct body; providing, that the secretary of each of such constituent body shall furnish a list of officers and a statement of the number of members of his respective organization to the Secretary-general not later than sixty (60) days before the meeting of the Congress, and shall forward a list of delegates chosen to reach the Secretary-general before the opening of the Congress.

By the Executive Committee, February 22, 1893.

THE CHICAGO MEDICAL PROFESSION ON THE WORLD'S FAIR ENTERTAINMENT.

At a meeting of the joint committee of the Chicago medical profession on the World's Fair Entertainment, held at the Sherman House, November, 1892, the establishment of a Bureau of Information and Service was delegated, with approval and endorsement, to Charles Truax, Greene & Co., the committee reserving to itself the duty of such social entertainment of visiting physicians during the continuance of the Exposition as may seem desirable.

This action was confirmed at the final meeting of the joint committee, February 25, 1893; and, on application of the Practitioner's Club and the South Side Medical Club, the matter of social entertainment was delegated to them, with full authority to act in the capacity of entertaining bodies, with

the retention of the chairman and its American and Foreign secretaries already appointed.

Chairmen.—Drs. Charles Warrington Earle and Archibald Church.

American Secretaries.—Drs. George H. Cleveland, John C. Cook and J. C. Culbertson; British, Dr. Sanger Brown; German, Dr. F. C. Hotz; French, Dr. Fernand Henrotin; Spanish, Dr. E. J. Gardiner; Italian, Dr. A. Lagario; Swedish, Dr. K. Sandberg; Canadian, Dr. R. D. McArthur; Russian, Dr. ———

The scope and duties of the above secretaries will be designated in the future.

C. WARRINGTON EARLE, M.D., Chairman.

AMERICAN MEDICAL ASSOCIATION.

DEAR DOCTOR.—The time for the annual meeting of the American Medical Association is so near at hand that all members who wish to contribute papers must send the title of their paper to the secretary before April 25, in order to have them appear in the general programme and in order to make arrangements for discussion. It is also urgently requested that brief abstracts be furnished not later than May 15, in the form in which the authors wish them to appear in the preliminary report of the meeting. The announced communications as well as the names of those who have promised to attend, assure the success of the next meeting. In view of the historical interest, which the Columbian celebration lends to the meeting, it is highly desirable that American ophthalmology should be well represented by the names and presence of those who have contributed to its present advanced position.

S. D. RISLEY, M.D., Chairman,
1722 Walnut St. Philadelphia.

H. GRADLE, M. D., Secretary, 65 Randolph St., Chicago.

THE AMERICAN JOURNAL OF

OPHTHALMOLOGY.

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ORIGINAL ARTICLES.

OPHTHALMIA ALBUMINURICA.

BY S. POLLAK, M. D., ST. LOUIS.

There is much in a diagnostic name which will surprise the reader, who may intuitively express a doubt as to its correctness. This surprise and doubt cannot be greater than my own. I refrained from making it until after many days of careful and assiduous observation, the conclusion forced itself upon me. In active ophthalmic practice, both clinical and private, of one-third of a century, I never met a parallel case, nor could I find one similar to it in the literature, whether foreign or domestic, within my reach.

Two of my esteemed colleagues saw the case with me, unfortunately not early enough, when the peculiar features were very demonstrative and unmistakable, but which they had to take on trust from me. When they were related to them in the presence of Clara's very intelligent mother, they both acknowledged never having seen any case just like it, or met with it in their readings.

I am fully prepared for, and earnestly invite the critical

judgement of, the active and intelligent workers in the field. A total loss of sight was manifest at my very first visit, a fatal result to her life, was once seriously apprehended, which, however, was happily averted.

I shall now proceed to give briefly the history of the case.

January 2, I was called to see Clara Harris, aged 7 years, the oldest child of very healthy parents, a bright and favored pupil of the public schools. She had enjoyed perfect health until the day after Christmas. It happened that her mother took her to a church to see a richly illuminated Christmas tree, the church was densely packed so that she could not get farther than the ninth or tenth pew from the door. This was the coldest night of this winter, the temperature ten degrees below zero. Clara was well enough wrapped, but the constant opening and closing of the door made her feel cold. She slept well that night, but next morning she asked her mother to let her sleep a little longer. She remained in bed that day and also the next day, complaining of being tired. Thursday, the third day, she cried out: "Mamma, the house is on fire." The mother tried to quiet her, but she insisted "the house is on fire; don't you see everything looks red?" She became restless, had some fever and a slight cough. The family physician, a very able man, was sent for. He saw her diligently for several days. He thought the hallucination was probably caused by some meningeal irritation. She grew worse, fever increased, but no more hallucinations. Not until Monday, the second of January, was it noticed that though she did not open the eyes, she shielded them always from the light. The lids were forcibly separated, and the physician saw at once that the eyes were seriously implicated. He directed that an oculist be sent for. I saw her Monday after dark; found temperature 103, pulse 112, tongue very coated, the buccal cavity filled with glary, tenacious mucus, which she in vain tried to expectorate. It had to be literally drawn out in long streaks by means of dry cotton or a piece of cloth, which was immediately consigned to the fire. This had to be repeated nearly every five minutes. There were no deposits left on the tonsils and fau-

ces. She could breathe and swallow without trouble; no cough. Thirst great, appetite none, bowels constipated, abdomen not tender nor tympanitic. Urine scant, skin dry. After this general examination, the condition of the eyes was looked into. The lids looked normal, she could but would not open them, but when I separated them I recoiled. *I saw only a perfectly chalky white globe, resembling nothing so much as the opening boll of a cotton plant*; cornea and sclerotic both perfectly white alike, the line of demarcation between them obliterated, a slight polish of the cornea made the only distinction. Not the smallest bloodvessel was seen. Conjunctiva moveable, not chemosed; tension normal, ball rather anæsthetic. No trace of the iris to be seen. The anterior chamber seemed to be filled with a white homogeneous substance, whether fluid or semi-solid indeterminable, neither was it certain that the parenchyma of the cornea was not involved. Motions of the eye unaffected, but there *was not the least perception of light*. The anæsthesia of the eye and of the surroundings rendered handling them easier. Yet, with all this, there was photophobia, for she always wanted to have the lamp removed. The same condition in both eyes alike. I was very much at a loss about the diagnosis. I only knew that she was totally blind, but whether from an organic disease of the eye or from a metastasis of some strongly saturated opaque fluid, and that what of and where from, I could not tell. She complained only of the trouble which the ever recurring accumulation of tenacious mucus in the buccal cavity gave her, which provoked slight cough, nausea, and the absolute necessity of drawing it out.

While a diagnosis had to be left in abeyance I had to institute therapeutic measures, partly with the object of giving relief and partly to arrive thereby at a diagnosis.

I ordered bathing the eye with absorbent cotton dipped in hot water every hour, which she seemed to like and called for often. Instilled into the eye atropine sulph., gr. iv to 5j; one drop hourly until I could get a sight of the pupil. *Internally*, a triturate of calomel gr. $\frac{1}{10}$ every hour, rinsing the mouth with strong solution of boracic acid. She slept well that night,

even the regular application of the above treatment did not rouse her. For the next two days the condition and the treatment was unchanged. Thursday, I learned that her bowels had been freely moved, and the buccal mucorrhœa was considerably less, but temperature yet 100, pulse 96. The mother also succeeded in furnishing me with some urine voided during the night, which on testing showed specific gravity 1024, was very acid, and on boiling a large quantity of albumin coagulated, so that on cooling nearly one inch of it remained in the test tube.

The albuminous urine furnished the first clue for a reasonable understanding of the case. I inferred therefrom that the exposure on Christmas night to a temperature of ten degrees below zero, caused an *acute nephritis and general albuminuria*, which by metastasis found a suitable soil in the eye, saturated strongly the aqueous humor and, perhaps made deposits of albumin on the tissues of the eyes. I made no change in the local treatment but suspended the triturations of calomel, and substituted the following:

R	Acetate of Potassium,	-	-	-	℥ss.
	Tr. of Digitalis,	-	-	-	℥j.
	Water,	-	-	-	℥ij.

M.

Sig. Dessertspoonful every two hours.

The effect of this change of treatment was promptly manifested by the lowering of the sp. gravity of the urine, diminution of of the albumin, and of the acid. On the other hand a notable increase in the quantity of urine, also an abundant perspiration set in. Not until Jan. 12, the tenth day of my attendance, did I discern the slightest change about the eyes. That day the chalky white cornea of the right eye became opalescent at the apex. This portion became even translucent the next day. This gradual clearing up from the center to the periphery of the cornea progressed with every succeeding day, until the pupillary margin of the iris came in view. The same clearing up process now commenced also in the other eye, and kept it up in proper ratio, so that in about two weeks both corneæ

were clear and the pupils dilated ad maximum, and yet not the least perception of light. The ophthalmoscope disclosed an opaque fundus; optic papilla and retinal vessels were not discernable. The external aspect of the eyes was normal, except mydriatic pupils.

In the meantime the general health had greatly improved. Temperature, pulse and respiration normal. The mucorrhœa and albuminuria entirely subsided. Her physical condition good, except the total absence of sight, and no change in the fundus of the eyes. I substituted now:

R	Bichloride hydrarg.,	-	-	-	-	gr. j.
	Potassi iodide,	-	-	-	-	ʒss.
	Water,	-	-	-	-	ʒvj.

M.

Sig. Teaspoonful every four hours.

I hoped thereby to effect the absorption of a probable albuminous deposit on the retina and other tissues of the eye. I made daily ophthalmic tests, both with direct and oblique illumination, but always with negative results.

Up to February 10 the condition of the eyes remained stationary, but a most unexpected change now set in, and the disease in both eyes assumed a new phase. That day, the conjunctiva of the right eye became hyperæmic, not chemosed, and the eye lachrymated a good deal; the pupil became smaller, though still under the use of mydriatics, the balls seemed to protrude, and for the first time she complained of bulbar, circumorbital and occipital pains. The pupil of the left eye became oblong, the anterior chamber very shallow, the capsule of the lens opalescent, but no pain. The motility of either eye somewhat impaired. All these symptoms were more intensified the next day, especially the protrusion of the right eye. This new inflammatory process was a painful surprise to me. My expectations of regaining a moderate amount of sight were always very feeble, and these were ended now. Panophthalmitis had set in in the right eye, and to save the form of it or even her life became now a paramount question.

I will here mention that Dr. Wolfner, who had just returned from a year's visit to the great clinics of Europe, saw her with me, and stated that he never saw a case like it, nor did his reading acquaint him with one, as he wrote me a few days later. My friend Dr. Alt also accompanied me to see this extraordinary case when the characteristic whiteness had totally disappeared, and declared he never saw or read of one parallel to it. The prominent symptoms at that day were entirely different, as if they were those of another patient with no relation to what I dealt with so long. It presented now a clear *painful panophthalmitis*, with high tension, considerable exophthalmus, with a yellowish white glistening fundus, limited motility, high temperature, rapid pulse, with life in danger. A glioma of the retina, or a retrobulbar tumor seemed to be present. Enucleation of the eye was considered indicated in order to save life. The intelligent mother yielded to the suggestion. I removed the eye, aided by my clinical assistant Dr. Keene, and gave it to Dr. Alt for microscopic and bacteriological examination. He preserved it in Mueller's solution for hardening.

My health was somewhat impaired in consequence of an attack of the grippe in January. I had to go South, to Cuba. On my return in April, I went to see little Clara, found her up and about, enjoying perfect health. The hyperæmia of the left eye, which also threatened to become like its mate, had subsided, but she is totally blind with a cataractous lens, distorted pupil and posterior synechia.

Having given a faithful and succinct history of this very strange case, I now appeal to the enlightenment and experience of the medical profession for a free and candid expression of their views on the following points:

1. Am I correct in crediting the exposure to the intense cold of Christmas night with causing the acute nephritis and rapidly ensuing albuminuria?

2. Was it ever known that amblyopia would develop in three days after any other cause but traumatism? I take it that Clara's statement that everything in the room looked *red* was an

actual fact, not a hallucination. It is known that a slight hæmorrhage in the vitreous body will cause a red reflex to every object in the field of vision, which does not subside until complete absorption of the blood has taken place.

3. Am I coincided with in ascribing the chalky white appearance of the cornea to the metastasis of albumen into the aqueous humor, and not into the parenchyma of the cornea? The eyes never exhibited any phenomena of inflammation nor redness, pain and swelling, yet she was totally blind, without an appreciable organic change.

4. The adage "*post hoc ergo propter hoc*" was proven in this case. In proportion as the quantity of albumin in the urine decreased, and micturation and activity of the skin increased, the density of the opacity of the cornea diminished, and when the urine became clear, transparency of the cornea ensued.

5. Was the subsequent advent of panophthalmitis in the right eye a mere coincidence, or the result of a new inflammatory process, or was it due to the agglutinated condition caused by the presence of albuminous deposits?

6. Did the timely enucleation of the right eye save the left eye from a destructive sympathetic ophthalmia? for from that moment not only the left eye but the general health commenced to improve rapidly.

7. Will I be credited with having described a faithful and not an exaggerated picture of the case? Those who know me will vouch for it, but with the large majority, to whom I am a stranger, a doubt might arise on that score.

I am also aware that this report is not made in a standard classical style, but I trust it bears the stamp of honesty and truth in every line of it.

CROUPOUS IRIDOCBOROIDITIS.

REMARKS TO DR. S. POLLAK'S CASE.—RESULTS OF THE HISTOLOGICAL EXAMINATION.

BY ADOLF ALT, M. D., ST. LOUIS.

On February 11, 1893, I saw C. H., with Dr. Pollak. She was then considerably emaciated and weak. There was fever and the pulse was somewhat fast and small. There was some exophthalmus. Photophobia rendered the illumination of the eyes very irksome to the patient. There was a great deal of episcleral injection of the eyes. The corneæ were clear. The right eye showed a large, irregular pupil, behind which a partially dim lens was seen. Iris and lens were almost pressed against the cornea by a yellow lobulated substance. V.=0; tension increased. The condition of the left eye differed but immaterially from the right one and its tension was not as high. The possibility of glioma having attacked both eyes was discussed, and the higher tension of the right eye prompted the decision of its enucleation. The chief point, if there was no glioma, was to find an explanation for the clinical symptom of the cotton-ball-like appearance of the eyes at an earlier period, as described by Dr. Pollak.

When the well hardened eyeball was opened, no tumor presented itself, and what appeared behind the lens was seen to be the totally detached retina firmly united with cyclitic newformations. The posterior chamber is totally obliterated; that portion of the anterior chamber which corresponds to the iris-angle is filled with a uniformly transparent gelatinous substance, while in the pupillary area the lens lies close to the cornea and obliterates this portion of the anterior chamber.

The space between the solid strand of the detached retinal tissue, which runs from the optic nerve forward to the cyclitic membrane, and the swollen choroid and also the suprachoroidal space, are filled with congealed exudation. Upon the inner surface of the choroid yellowish masses are deposited in thick layers and in smaller lumps. These masses are thicker near the ciliary body than in the posterior portions.

Microscopically the changes are peculiar in the uveal tract only. The iris and ciliary body are so filled with round cells that their normal tissue is almost invisible. The choroid is many times its normal thickness. Its inner parts (choriocapillary layer) are made up solely of round cells, which are severed from the exudation lying inwardly by the lamina vitrea. Its outer parts (venous layer) and the suprachoroidal tissue and space are filled with a *network of fibrine* containing the remnants of the normal tissues and round cells. This peculiar network reaches forward on the outer surface of the choroid and the ciliary body to the insertion of the latter into the corneo-scleral tissue.

This condition resembles closely that found in the lungs in croupous pneumonia, and the spongy exudation in the anterior chamber seen in some cases of iritis. The latter I described years ago, and considered it as the result of a *hæmorrhagic* iritis, as the iris was filled with hæmorrhages in the case I had examined microscopically. Dr. S. M. Burnett afterwards called the iritis with spongy exudation into the anterior chamber *croupous* iritis. In the case under consideration a croupous cyclitis and choroiditis still existed when the eyeball was enucleated. I think, therefore, that it is not too far-fetched to explain the strange clinical aspect, described by Dr. Pollak, as produced by spongy (croupous) exudation in both anterior chambers due to *croupous iridochoroiditis*. When I saw the case this exudation, as it always does, had melted away and had been mostly absorbed. There were, also, no hæmorrhages visible.

I do not remember ever having seen such a general croupous inflammation of the uveal tract in man.

I have seen it, however, as the result of the experimental injection of jequirity infusion into rabbit's eyes, corresponding in all its details to the condition of the eye under consideration. (See this Journal, Vol. I, No. 4, page 97, et ss.). The croupous membrane produced by jequirity on the conjunctiva looks microscopically exactly like it.

In retinae with albuminuric retinitis due to chronic nephritis a similar croupous exudation is often found lying in small cavities within the retinal tissue. In the eye under consideration the retina, however, is free from any such exudation.

In order to study the bacteriological side of the question both Dr. L. T. Riesmeyer and I stained with methylene blue and after Gram's method, a considerable number of specimens taken from the yellow masses which were deposited upon the inner side of the choroid. I also stained in the same manner a number of sections of the tissues of the eye. In all of these specimens we found micrococci. They are, however, more numerous in the exudations than in the tissues, yet I found them also in the tissue of the choroid. These micrococci are usually arranged in clusters, and do not seem to differ from the staphylococcus pyogenes aureus. Besides these clusters a large number of cocci lie singly or in small groups of three or four disseminated through the exudation. I have found none in the other tissues of the eyeball.

From the history of the case it would then seem that we had to deal with a *croupous nephritis* and a *croupous iridochoroiditis*, perhaps both due to the immigration of the same microbe, which in the eye resembles most to the staphylococcus pyogenes aureus.

Choroiditis with spongy exudation has been clinically seen once by Knapp. I do not know that it has ever been histologically described in man.

SOCIETY PROCEEDINGS.

AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.

THE VALUE OF VOLTAIC ALTERNATIVES IN OPTIC NERVE ATROPHY.

Charles Eugene Riggs, A.M., M.D., Professor of Nervous and Mental Diseases in the University of Minnesota, St. Paul Minn., Member of the Neurological Association, Member of the American Electro-Therapeutical Association, read the following paper:

My attention was first called to the value of voltaic alternatives in atrophy of the optic nerve by Dr. Webster Fox, of Philadelphia, who said that he had obtained from their use some results so surprising that he hesitated to publish them because of the incredulity with which he felt they would be received by the profession.

This strong recommendation from so eminent a man resolved me to make trial of them in my own practice should occasion arise, but for some time I was deterred from the habitual use of them by the fact that in the ordinary instruments the only way of alternating the currents is by the hand, which is not only tiresome in the extreme, but also undesirable as the frequent use of the commutator in this manner renders the battery unreliable for careful diagnostic work. Also in using the hand the precision of the make and break will necessarily vary a little; consequently there will not be the same smoothness of current as though the action was automatic. To remedy this defect I requested Dr. H. E. Waite to construct for

me an automatic commutator, which has proved satisfactory in every way.

I first tried the voltaic alternatives upon a patient sent to me by Dr. Graham, of Minneapolis. He reported that when first examined he found the media clear, hyperæmia of the optic disc, with outlines slightly blurred, veins slightly enlarged and tortuous, arteries reduced. The treatment before the use of the voltaic alternatives had been iron, quinine and strychnia, with no improvement resulting. After the use of voltaic alternatives had begun she improved very slowly, by almost imperceptible degrees. She was under this treatment for two or three months, and examinations made in the meantime by Dr. Graham showed unquestioned improvement in the eye condition. At the end of this period she was obliged to leave the city, but wrote me at the end of six months that the improvement had been continuous and was still going on.

For the next case that I treated I was indebted to the courtesy of Dr. E. H. Wood, of St. Paul. I subjoin the report of the case as taken from Dr. Wood's notes.

J. W., aged 52, farmer. July 25, 1891. Says six months ago eyesight began to fail and 'everything looked milky.' No pain in head or eyes.

Examination: Vision in right and left eye, counts fingers at ten feet; not improved by glasses. Cornea clear, tension normal. Pupil acts to light and accommodation. Ophthalmoscope shows both optic discs very pale, medium-sized physiological cup, bloodvessels medium-sized, vitreous clear and rest of fundi normal. No history of injury or syphilis. Says memory is getting very poor and that he often forgets what he came to town for. Has numbness of legs and arms, spastic contraction of fingers, no ankle-clonus, but there is increased knee-jerk in right and diminished in left leg. Diagnosis, atrophy of optic nerve. Treatment: Elix. cinch., ferri et strychniæ, hypodermic injections of strychnia in temples and electricity, also doses of potassium iodide.

Aug. 14, R. V.=⁶/_{xxxvi.} L. V.=⁶/_{lx.}

Aug. 27, R. V. = $\frac{6}{XXIV} + 1.5$ D. = $\frac{6}{IX}$. L. V. $\frac{6}{XXXVI}$, not improved by glasses. Patient returned home.

My examination of the man demonstrated the existence of nervous trouble, indicated by the symptoms Dr. Wood had observed. The result of the use of voltaic alternatives in this case was most astonishing.

After the first week's treatment the patient declared himself decidedly improved, and the improvement was rapid and continuous while he remained under my care. That the improvement was permanent is witnessed by the subjoined note of Dr. Wood, who made a special re-examination of the case for the purpose of this paper a few weeks ago.

"Sept. 4, 1892.—Examined him and found that he had been working most of the time; said memory continued good, numbness and spastic contraction did not return and that his eye-sight remained about the same.

"R. V. without glasses $\frac{6}{XXIV}$, with plus 1.5 D. = $\frac{6}{IX}$.

"L. V. without glasses $\frac{6}{XXXVI}$, with plus 1.5 D. = $\frac{6}{IX}$.

"Field of vision has never been carefully taken."

In a third case which was sent me by Dr. Chamberlain, of St. Paul, the treatment produced no beneficial results. This patient became discouraged after six weeks or two months treatment, and falling into the hands of "faith healers" discontinued treatment, so that I do not consider in view of the fact that the trouble was of long standing, that the treatment was given a fair trial in this instance. I subjoin notes of Dr. Chamberlain upon the case.

"X. Y., aged 46, general office in R. R. land department, came to me in 1890, complaining of a strained feeling about his eyes.

R. V. $\frac{20}{...}$. L. V. $\frac{20}{...}$.

Myopic astigmatism of about two dioptries to each eye; this corrected gave him R. V. $\frac{20}{XXX}$, but did not improve the left save, as he said, to brighten it up a little. His work being largely reading of correspondence and examining fine lines on the maps and fine figures in books, I prescribed rest in addi-

tion to change in his glasses, the latter he obtained but the former he did not take.

In giving his history, he said that six years previous while his eyes were undergoing an examination, he found that he had very little vision in his left eye, something he had not known before. The ophthalmoscope showed the left disc to be very pale and vessels reduced in size. The right disc, however, seemed nearly normal. He returned to his work and had no trouble with his vision until about June, 1890, when he returned to me saying that his vision was getting bad in the other eye. He had been working very hard and was reduced physically, so I advised immediate rest. The retina and optic disc were in an irritable and somewhat congested condition. After a month's rest, though physically improved, he could see absolutely no improvement in his vision, which at this time equaled part of $\frac{20}{XL}$ with the right eye, the optic disc being paler than normal, and the vascular condition being somewhat reduced. I put him upon potassium iodide and also strychnine, both hypodermically and by the mouth. I referred him to Dr. Riggs for electricity.

"Sharpness of vision slowly decreased. Sept. 20 it was only a guess at $\frac{20}{XL}$, September 30 it was only $\frac{20}{L}$, and by November was reduced to $\frac{20}{LX}$. About this time he passed out of my sight."

I am at present trying voltaic alternatives in a number of cases representing various forms of brain disease, but the experiments have not yet been sufficiently prolonged to justify me in recording any opinion as to results.

The stimulating affect of this current and its influence on nutrition is evident if one considers its physiological aspect. That the reversal of the polarity of the electrodes in its use is much more energetic than the simple closures, is very evident if one understands the nature of the phenomena.

De Watteville (*Medical Electricity* p. 108) says: "When the electrode on the nerve is alternately changed from anode to cathode, and from cathode to anode, a series of closure excitations are given, which fall alternately in the polar (when the

electrode becomes anodic) region respectively. Now in either case the excited region had just before been under anodic influence, and physiology teaches us that as we shall presently demonstrate on the human nerve, the instant the polarizing current ceases to flow the anodic region passes into a state of increased excitability. This augmentation is the more marked the longer the anodic influence has lasted. We see, therefore, how it is that voltaic alternatives act more powerful than in simple closures of the circuit, and that their action is intensified by previous current duration. We understand also why rapid reversals are the most effectual; for the positive modification after an electrotonus diminishes rapidly after the circuit has been broken; the longer the interval which elapses between the polar change of the electrode the less the hyper-excitability of the nerve will be, until it has returned to its normal state."

Althaus (*Medical Electricity* p. 225) emphasizes also the fact of the increase of excitability when the voltaic alternatives are frequently repeated.

It is to be hoped that such workers in this line as Dr. Webster Fox and his coadjutors will soon lay before the profession the results of their large experience. In this article I have only designed to be suggestive and to stimulate my confrères to investigation, that the true value of this therapeutic measure may be thoroughly ascertained. If in the use of voltaic alternatives has indeed been found the remedy for even a part of the cases of atrophy of the optic nerve, the fact cannot be too soon established or too widely known.—*N. Y. Med. Jour.*

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, MARCH 9, 1893.

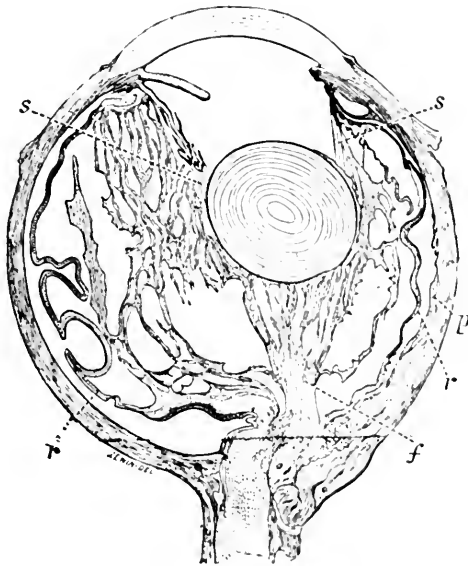
W. A. BAILEY, M. D., in the Chair.

Before beginning the ordinary business of the Society, the Chairman, in a few well-chosen remarks, alluded to the great loss the Society had sustained in the death of Dr. James Anderson, a former Secretary and valued member of the Society.

MICROPHTHALMOS.

Mr. Treacher Collins showed a series of lantern slides, illustrative of the changes he had found in three microphthalmic globes. Two of the three eyes had been obtained from a child who had died when four days old from congenital heart disease. In the left eye (see Figure) the lens was displaced backwards, being situated nearly in the centre of the globe. In the middle of the vitreous was a band (*f*) composed of elongated cells and fibres, with bloodvessels amongst them; it passed from the posterior pole of the eye just below the optic disc to the back of the lens. Bands of fibres and cells, similarly situated, had been described by Hess, and Mr. Collins agreed with him that they were probably the result of a typical development of the intruding mesoblast, which should have formed vitreous. The displacement of the lens was due to this band of fibres and cells having kept it moored, while the anterior portions of the eye grew forwards, the ciliary pro-

cesses and fibres of the suspensory ligament becoming thereby greatly stretched. In this eye there was also a coloboma of the iris. In the right and left eye there was posteriorly below the optic nerve a protrusion due to a projection of retinal tissue through a gap in the sclerotic.



DESCRIPTION OF FIGURE.

Semi-diagrammatic section of the left eye of Case I.

(s) Suspensory ligament of lens stretched and attached to elongated ciliary processes.

(r) Retina, much folded.

(f) Fibrous tissue in centre of vitreous, holding lens back.

p points to pigment epithelial layer at the position where it ceased to be pigmented and where the choroid ended.

The third eye, which was removed from a lad; aged 18, had connected with it, in a similar position, two large cysts lined

throughout by degenerate retina. The cysts in this case, and the projections from the eyes in the other, had probably been caused by the protrusion of one of the folds, which are normally present in the human foetal eye, through the ocular cleft and its sequestration in the surrounding mesoblast; a process analogous to the formation of dermoid cysts by the inclusion of a portion of cuticular epiblast in one of the branches or other foetal clefts. A theory somewhat similar to the above has been propounded by Kundrat. In none of these eyes was there any indication that the changes found had resulted from intrauterine inflammation.

REMOVAL OF A CHIP OF STEEL FROM THE VITREOUS.

Mr. Tatham Thompson read notes of a case in which he had removed a large fragment of steel from the vitreous by means of the electro-magnet. Two peculiar points were mentioned in connection with the case. First the extraordinary track followed by the foreign body, which had passed through the upper lid almost at right angles to the skin surface, and, penetrating the sclerotic at 7 millimeters from the corneo-sclerotic junction, had apparently turned on its axis, as it was found to be standing vertically in the vitreous, with its long axis almost parallel with the lid surface, and its lower extremity resting on the retina embedded in lymph. The second point was the way in which the foreign body, which measured 14 millimetres by 2 millimetres, and weighed 0.037 gramme, had been tolerated, the patient not complaining of bad symptoms till a fortnight had elapsed. Three weeks after the accident the fragment was removed. A flap of tissue was raised at the outer side of the insertion of the inferior rectus tendon, an incision made in the sclerotic, and the fragment removed by means of the electro-magnet. The patient made a good recovery. Charts showing the field of vision before and after extraction, and the fragment of steel were shown.

REMOVAL OF ENLARGED LACHRYMAL GLANDS.

Dr. Sandford (Cork) read notes of the case of a farmer who came under his care for enlargement of both lachrymal glands to such an extent that the right eyelids were completely and the left almost completely closed. A large smooth painless swelling could be felt in the region of the gland in each orbit. The patient was in good health and had not had syphilis. There was some enlargement of the lymphatic glands in the neck, and hypertrophy of the lymphoid tissue in the pharynx. The lachrymal glands were removed, the left first and the right a month later. The result was restoration of the palpebral aperture on each side. Two years later the patient was in good health and had had no further ocular trouble. The growths on examination proved to be adenomata. Dr. Sandford referred to somewhat similar cases reported by Messrs. Adams Frost, Power and Snell.

FOREIGN BODY EMBEDDED IN THE EYE FOR FIVE YEARS.

REMOVAL.

Dr. Sandford reported this case. The patient, a lad aged 16, had been struck in the eye by a needle five years previously. On examination a portion of a rusty needle was seen, one end being in corneal tissue and the other end in the lens, passing through the iris. There were evidences of former iritis, and the lens was opaque. V = p. l. The portion of needle, which measured half an inch in length, and the lens matter were removed. The eye made a good recovery from the operation, and vision of $\frac{6}{18}$ and J. 2, with correction, was eventually obtained.

LIVING AND CARD SPECIMENS.

Mr. Power.—Case of Congenital Exophthalmos.

Mr. Lawford.—Peculiar Changes in Macular Region, possibly of traumatic origin.

Mr. Silcock.—Case of Conical Cornea.

Mr. Brailey.—Case of Doubtful Nature, with many of the symptoms of Glaucoma.

Dr. Abercrombie.—Post mortem specimens from a case of Proptosis and Intracranial bruit (reported in Trans., vol. x., p. 248).

NEWS.

POST-GRADUATE MEDICAL SCHOOL OF CHICAGO—WORLD'S FAIR ANNOUNCEMENT.

COURSE 5.—Five special courses of evening and morning lectures by prominent foreigners and Faculty. Eye and Ear, Nose and Throat, three evenings each week, from May 15, to July 1. Hermann Knapp, Henry D. Noyes, New York; Herman Krause, Berlin; Th. Heryng Warsaw, (August); Prof. Massei, Naples; Jonathan Wright, Brooklyn; J. O. Roe, Rochester; J. C. Mulhall, St. Louis; W. F. Coleman, Boerne Bettman, C. A. Wood, Frances Dickinson, B. M. Behrens, T. M. Hardie, F. D. Owsley, Geo. Morgenthau, Chicago.

Fees \$10.00. Matriculation fee of \$5 charged for all new students. Desirable seats in order of application may be reserved for course 5, and board secured not to exceed \$10 to \$12 a week for each member of party, by forwarding matriculation fee. For Bulletin No. 4, which gives all particulars, send to

Dr. FRANKLIN H. MARTIN, Secretary,
Venetian Building, Chicago.

THE PAN-AMERICAN MEDICAL CONGRESS.

By arrangements with the committee at Rome, the date of the Eleventh International Medical Congress has been so appointed that those who attend the meeting of the Pan-American Medical Congress may subsequently attend the former. The Pan-American Medical Congress will adjourn on the afternoon of September 8; a steamship will sail from New York on the following day, going by the Azores and Gibraltar and en-

abling the tourist to reach Rome on the morning of September 20, where the Eleventh International Congress will be opened on the afternoon of September 24. It will thus be seen at a glance, that in the period usually allotted to a summer vacation, the medical tourist may spend a week at the World's Columbian Exposition, the next week at the Pan-American Medical Congress, the next week and-a-half with delightful companions in a voyage to the Mediterranean, the next few days in witnessing the sights of Rome, and the following week at the Eleventh International Medical Congress. Special reduced rates for members and their families are given both ways on the trip to Rome, particulars of which will be furnished on application to the Secretary-General, 311 Elm Street, Cincinnati, Ohio, who is also a member of the American committee of the Eleventh International Congress.

The best possible arrangements will be made with the excellent hotels with which the National Capital is abundantly supplied. The Committee of Arrangements will do its utmost to secure desirable rates and locations for members and their families. The headquarters of the Committee of Arrangements is at the Arlington Hotel, where communications may be addressed, either to Dr. Samuel S. Adams, Chairman, or Dr. J. R. Wellington, Secretary.

CHARLES A. L. REED, Secretary-General.

SELECTIONS.

ETIOLOGY OF OPHTHALMIA IN THE NEW BORN.*

BY H. V. WÜRDEMAN, M.D., OF MILWAUKEE, WISCONSIN.

Much has been written upon the subject of ophthalmia in new born infants, especially as regards prevention and treatment. To the teachings of Credé,² Valude¹¹ and others may be ascribed the lessened percentage of cases following their methods of prophylaxis. Individual experience on any subject, however well established, is of value, but I will limit my remarks to the etiology of the conjunctivitis of infants.

In many children the edges of the eyelids are slightly red for a few days after birth, and there may be a little sticky secretion which disappears under simple means, as washing with lukewarm water and vaseline. This condition should give rise to no uneasiness on the part of the attendant, but of course the case should be watched. Some infants contract acute catarrhal conjunctivitis which differs but little from that in adults, and likewise, in a small proportion of cases, may pass into a sort of follicular conjunctivitis. This is the milder form of ophthalmia which demands our attention in this connection. The other is that to which the term of blennorrhœa neonatorum may be properly limited. Some authors²³ arbitrarily divide this into two classes; the severer type in which the gonococcus of Neisser⁶ is generally found, which has a tendency to increase in severity and invade the cornea, and a milder type

*Read at a meeting of the Milwaukee Medical Society, February 14, 1893.

in which a bacillus⁹ (discovered by Weeks), is prominent among the micro-organisms, and which tends to recovery. However this may be, in my experience all cases in which there is a purulent discharge seemed alike in nature, and even where gonorrhœal infection was known, the cases differed in severity. I think that the majority of cases, if neglected, would tend to ulceration of the cornea, the immunity of others depending upon the resisting power of the tissues. In all instances various micro-organisms are found, and even in confessed cases of gonorrhœal infection the peculiar coccus of Neisser may be absent.¹⁰

Blennorrhœa neonatorum is one of the most fatal of diseases to vision. Horner¹ gathered statistics from different countries, finding that the inmates of blind asylums made sightless by this disease varied from 20 per cent. to 70 per cent.

Gentlemen, as you well know, vice and neglect may creep into the residence of the rich as well as into poverty's abode. The infant leaves the warm, dark and comfortable environment of its mother's womb for the cold and cheerless world, is received perhaps into the lap of luxury with modern aseptic precautions of the intelligent practitioner, or is tossed in its filth into a bundle of rags. Or mayhap, if born to parents of the working or middle classes, it may or may not be properly attended by a physician or midwife. Besides as a direct inheritance from its parents, the neglect or opposite extreme of ill-directed zeal on the part of the immediate attendants may cause such diseases as infantile eczema, bronchial or other lung troubles, otitis or ophthalmia.

The causes of the milder forms of conjunctivitis in infants are ascribed, as in adults, to either zymotic or chemical irritants, with the addition of special causes appertaining to the environment of the lying-in chamber or negligence of the attendant, as exposure of the child's eyes to glare of light while washing it, wiping face and eyes with soiled and rough towels, the entrance of meconium or urine, the use of poor soap, etc. The vernix caseosa is the natural protection of the child during birth, being particularly abundant about the creases of the

limbs, neck and face. In its journey through the genital passages of the mother it becomes well smeared with her secretions. By ill-directed efforts at cleansing these may be carried into the eyes, and even if not septic may give rise to some irritation. It is the concensus of opinion that nearly all of the severe cases are of gonorrhœal origin, arise from the morbid secretions of the mother. Inoculation with normal natal secretions has not given rise to the disease.^{3 10}

All mothers suffering from gonorrhœa do not infect their new-born offspring, especially if due precautions have been observed by the attendant. Whatever may be the origin of both forms of the disease, the most frequent subjects are weakly children who are exposed to the debilitating effects of bad air, insufficient clothing, insufficient food; in fact among the poor, also premature infants. But are not the mothers of these children prone to leucorrhœa?¹²

The contagion usually occurs after birth, being commonly due to negligence or ignorance of the nurse in washing the infant, whose face and eyes may be cleansed (?) in the same water as that of the body and dried with the same cloth, the vernix being wiped away and the infecting material wiped in. Where the child is not washed at once, but left in its filth, smeared with lard, goose grease, skunk oil, angleworm oil or what not, the entrance of contagion is even more obvious. I was brought up to believe that *all* cases of ophthalmia in the new born might be ascribed to neglect on the part of the nurse or accoucheur. This is an extreme view, and I now think that infection may take place in the specific form at any time after the rupture of the membranes. Face presentations are particularly liable¹⁰ where the element of contagion is present. Statistics on this point are difficult to obtain in private ophthalmic practice, thus but few notes will be found of the presentation in my account of cases.

The affection may occur the first moment that the child opens its eyes, even before birth in the genital passages or even in the uterus itself, as in a case reported by Nieden⁷ of a child born in the membranes where the amniotic fluid was infected.

SIMPLE CONJUNCTIVITIS.

<i>Number</i>	<i>Name.</i>	<i>Occupation of Male Reported Parent.</i>	<i>Date Reported of Beginning.</i>	<i>Age at First Consultation.</i>	<i>Duration after Consultation.</i>	<i>Attendant at Labor.</i>	<i>Supposed Cause.</i>	<i>Result and Remarks.</i>
1 G.		Plumber.	3 day.	3 days.	2 weeks.	Physician.	Negligence in washing.	Health.
2 L.		Merchant.	2 weeks.	3 weeks.	2 "	"	"	"
3 D.		Merchant.	Birth.	3 days.	1 week.	"	"	Health (much venis).
4 P.		Dentist.	"	3 "	2 weeks.	"	"	" "
5 G.		Machinist.	2 day	6 "	2 "	"	Negligence in washing.	Health (muco-purulent discharge).
6 F.		Physician.	Birth.	1 day.	2 "	"	Slight leucorrhoea	Two months later had follicular conjunctivitis.
7 M.		Saboon.	5 day.	7 days.	1 week.	"	Exposure to light.	Health.
8 P.		Coal.	3 "	5 "	4 weeks.	Midwife.	Negligence in washing.	Health.
9 P.		Coal.	3 "	5 "	"	"	Negligence in washing.	Twins. Child died 10th day.
10 S.		Dentist.	7 "	16 "	2 weeks.	Physician.	Exposure to light.	Six weeks later had follicular conjunctivitis.
11 K.		Drug Clerk.	8 "	10 "	2 "	"	Infection from nurse with dacryocystitis.	Health.
12 H.		Clerk.	Birth.	2 weeks.	3 "	"	"	Health (muco-purulent discharge).

BENORRHOEA NEONATORUM.

<i>Number</i>	<i>Name</i>	<i>Occupation of Male Parent</i>	<i>Date Reported of Beginning</i>	<i>Duration after Consultation</i>	<i>Attendant at Labor</i>	<i>Supposed Cause</i>	<i>Result and Remarks</i>
1 I.		Laborer.	4 days.	3 weeks.	Midwife.	"Whites" in mother.	Leucoma R. Clear L.
2 C.		Railway clerk.	2 "	2 weeks.	Physician.	Gonorrhoea in father.	Patient was taken to another physician after I had given an unfavorable prognosis.
3 A.		Illegitimate child of 2.	2 "	2 weeks.	"	Leucorrhoea in mother.	Health.
4 H.		Laborer.	4 "	4 weeks.	Midwife.	Gonorrhoea in father.	Leucoma R. and staphylocoma R. Leucoma L.
5 G.		Illegitimate child of 4.	4 "	4 weeks.	"	"Whites" in mother.	Leucoma both corneae.
6 S.		Illegitimate child of 2.	"	4 days.	"	Gonorrhoea in mother.	Child died in third week. Collapse of both eyes.
7 W.		Laborer.	6 "	6 weeks.	"	Gonorrhoea in father.	Leucoma L. Clear R.
8 C.		Laborer.	2 "	2 weeks.	"	"	"
9 D.		Plumber.	2 "	4 days.	Physician.	"	Face presentation; both corneae clear; child died few weeks later of pneumonia.
10 E.		Laborer.	2 "	5 weeks.	Midwife.	"	Leucoma R. Collapse L.
11 K.		Illegitimate child of 2.	2 "	4 days.	"	"	Seen but once.
12 H. fatal Case.		Illegitimate child of 2.	1 "	1 "	Physician.	"Whites" in mother.	L. O. A. Presentation. Child died in third week. Collapse of both eyes.
13 H. fatal Case.		Illegitimate child of 2.	1 week.	2 weeks.	"	Contagion carried by nurse from No. 12.	Health.

In three of my cases (delivered by physicians noted for the care bestowed upon their accouchements), where the gonorrhœal element was known to exist and where the usual prophylactic precautions were instituted, the infection undoubtedly occurred before birth.

The disease may likewise arise some days or even weeks after birth, from the fingers of the nurse, mother or child, towels, etc., soiled with the maternal secretions. Where the infant occupies the same bed with the mother, soiled bedclothes may be a carrier of the contagion.⁴ It must be remembered that gonorrhœa may only be propagated by actual contact of the virus in a fresh state with a mucous membrane. Yet round-about methods of infection are known, as house flies⁴ being the carriers from one infant or from soiled clothes to another's eye. The picture of a sick infant with its face covered with flies is common in the hovels of the South in hot weather. In hospitals, the attendants, be they ever so careful, may infect other children. Thus special nurses should be retained and the cases isolated. The virus seems attenuated by being carried from one child to another, the resulting cases being lighter as a rule.

The original factor in this disease is the father's lapse of virtue by which he acquired a specific urethritis. With him it is advisable to speak plainly, to handle the subject with bare hands, to make him acquainted with the results of his iniquity, in order to inspire in his mind sufficient interest in the case that efficient treatment may be given the child. Of course this disease is more common among the lower classes, who are prone to neglect the disease until too late, or to follow out the cleansing and other treatment in a perfunctory sort of a way, unless their minds are sufficiently impressed with the responsibility of the case. Many children are brought to the physician after the cornea has collapsed through ulceration, the case being looked upon by the midwife as a "cold in the eyes," and treated by poultices or other uncleanly applications.

It has been said that a non-specific vaginitis in a perfectly irreproachable individual may produce a typical gonorrhœa in

the male. Likewise an ophthalmia may result from leucorrhœa in the mother. However this may be, the gonococcus of Neisser is found⁹ in the great majority of cases of malignant ophthalmia. The origin of some of these might perhaps be traced as in the following, which is vouched for by a friend of mine as occurring in his practice:

The father had been apparently cured of gonorrhœa six months before marriage and the child was born after over a year of married life, he himself remaining free from urethritis and his wife being apparently well. The child developed a severe case of ophthalmia neonatorum which ran the usual course. When the child was nearly well the father applied to the same physician with acute urethritis, denying *in toto* all exposure. The man had probably never been cured of his first gonorrhœa. This brings up the question of the liability of the gonococcus and its retention for indefinite periods within the vaginal folds of the mother without the production of an appreciable amount of vaginitis. This may be so, as some women are apparently immune to the ravages of the gonococcus. Note some women of the town who are apparently free from gonorrhœa, and yet who occasionally infect some of their visitors, while the majority escape.

I append an abstract of twenty-five recent cases of conjunctivitis in new born infants seen in private practice, from which some of my statements have been deduced, others being duly authenticated.

The small number of cases of catarrhal conjunctivitis in proportion to those of the graver disease may be remarked, as the lighter form is of common occurrence, while the blennorrhœa is relatively rare. This may be explained by the fact that most of the latter ultimately apply to the specialist for treatment, while the lighter forms being readily subdued by the attendant or by household remedies, or getting well without treatment, do not usually call in a physician for the eye affection. In eleven of the cases of infantile catarrhal conjunctivitis the labor was attended by a physician, and in the others by a midwife. All of these cases were seen by wish of

the medical attendant. The cause of three cases was believed to be due to the exposure of the child's eyes to light; one to infection from a nurse who had dacryocystitis; five to carelessness of the nurse in washing the child, etc.; in one the mother had a mild leucorrhœa, and in the other three no cause could be ascribed. Two of these cases were muco-purulent, and two others suffered later from follicular conjunctivitis. In all the catarrhal symptoms yielded to treatment within a few days and at no time presented any corneal complications. All of these cases were in the better class of patients.

It will be noticed that the majority of the cases of blennorrhœa neonatorum occurred in children whose parents were of the lower walks of life. Five of these children were illegitimate. In seven cases the father acknowledged having had gonorrhœa within several months before the child's birth, and in one case the mother. In four the mother said she had "whites," and as three of these children were illegitimate, gonorrhœa was possible. In the thirteenth case the contagion was probably carried by the nurse who was attending No. 12 in a neighboring bed. The majority of these were delivered by midwives, presumably without proper precautions. In three of the cases (Nos. 3, 9, 12) delivered by physicians, prophylactic measures *a la Credé* did not afford immunity. Two of the children died of marasmus after loss of both eyes. One of the others was so depleted by the long course of suppuration that it succumbed to pneumonia within a few days of the commencement. Ulceration occurred in fourteen eyes, of which the vision in nine was subsequently lost. The majority of the cases of blennorrhœa applied for treatment after ulceration of the cornea had set in, and when the parents had lost faith in the ability of the midwife to handle the affection.

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¹Chibret, "Pathogeny of Affections of the Conjunctiva from a Bacteriological Point of View," Cong. franc. d'Ophthal., May, 1891.

²Credé "Die Verhütung der Augenzündung der Neugeborenen," Arch. f. Gynækol., xvii.

³DeSchweinitz, "Diseases of the Eye," 1892.

⁴Fuchs, "Augenheilkunde," 1889.

⁵Horner, "Krankheiten des Auges im Kindesalter." Hdbh. d. Kinderkrankheiten, 1879.

⁶Neisser, Centralbl. f. Med. Wissensch., xxviii, 1879.

⁷Nieden, "On a Case of Blenorrhœic Conjunctivitis in a Child Born in the Membranes," Zehender's Monatsbl., xxix.

⁸Noyes, "Diseases of the Eye," 1890.

⁹Panas, in discussion of Ref. 1.

¹⁰Schmidt-Rimpler, "Augenheilkunde," 1889.

¹¹Valude, Ann. d'oculist., cvi.

¹²Walton, "Diseases of the Eye," 1875.

REVIEWS.

MANUAL OF CLINICAL OPHTHALMOLOGY.—By F. Hansell, M.D., and J. H. Bell, M. D.; with 120 Illustrations. Philadelphia: P. Blackiston, Son & Co., 1892. Price, \$1.75.

This very neat little volume which, as the authors state, is intended as a brief review of the anatomy, physiology, refraction and common diseases of the eye, fulfills very well what it is meant to be. It has a great many good illustrations and in type and make-up is very recommendable.

A HANDBOOK OF THE DISEASES OF THE EYES AND THEIR TREATMENT.—By H. R. Swanzy, A.M., M.B., F.R.C.S.I. Fourth Edition with Illustrations. Philadelphia, P. Blackiston, Son & Co., 1892. Price, \$3.00.

The rapidity with which this fourth edition of Swanzy's text-book has followed the third one shows plainly how practical and popular it is. The new edition is considerably enlarged and new illustrations have been added. It is a very valuable book alike to the student and the practitioner.

These books may be obtained of J. H. Chambers & Co., 914 Locust St., St. Louis.

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NO. 6.

ORIGINAL ARTICLES.

SARCOMA OF THE ORBIT EXTENDING INTO THE
CRANIAL CAVITY.

BY DR. S. C. AYRES, CINCINNATI, OHIO.

HISTORY OF THE CASE.

M. C., *æt.* 34, came under my observation in March, 1891. He had at that time a slight exophthalmus of the right eye. The motility of the eye was unimpaired and evidences of a tumor could not be felt with the tip of the finger around the rim of the orbit. Vision was 0.4 and with cylindrical plus 0.7. The disc was somewhat pale. In two weeks there was a marked increase in the exophthalmus and vision was reduced to 0.1 and the disc was decidedly blurred. After this I did not see him for eight months. In the meantime an operation had been performed for the removal of the growth. An attempt had been made to save the globe which was not successful. Panophthalmitis followed and he said that his sufferings were intense. The orbit was now filled with a hard nodular mass which advanced slowly. His general condition

was very bad, digestion and assimilation impaired, and he suffered severely with pain in the back part of the head. Three months later, Jan., 1892, the tumor showed considerable increase. Five firm nodules could be seen above the rim of the orbit. There was also considerable swelling below the malar bone and apparently in the antrum. He suffered excruciating pain in the occipital region and the cervical portion of the spine was very tender to pressure. Tongue red and dry at times. There was some difficulty in deglutition and he complained of a sensation as if there was something pressing downward from the right side of the vault of the pharynx. He had also at this time paralysis of the *right* arm which he said had existed for the past two months. There was also total loss of sight of the left eye. This came on about three weeks after the paralysis of the right arm. The pupil was widely dilated. There was no swelling of the disc, or evidence of neuro-retinitis—on the contrary, the disc was pale and atrophied. The loss of vision had come on very rapidly. He was very much emaciated but was able to take nourishment quite well. The pain in the head was more severe than formerly and in order to secure rest he required two hypodermic injections of morphine daily. There was an elevated and tender ridge on the skull following the line of the coronal suture and extending to the sagittal suture. The scalp was reddened along its course. The outer right half of the skull was tender to pressure. His intellect remained perfectly clear until the day of his death. Emaciation continued and he died about thirteen months after the first examination.

POST-MORTEM EXAMINATION.

Upon examination of the head and the cranial cavity there is seen a prominent ridge extending from the upper anterior portion of the temporal bone downward and forward to the upper and outer angle of the right orbit. To the touch this line was more or less rough and irregular and was of variable width, its widest part being about three-eighths of an inch

broad. Upon removing the scalp from the calvarium, the right anterior portion of the frontal bone and the anterior portion of the right parietal bone were found to be much softened and of a reddish color, and covered with what appeared to be a thick granulation tissue. The point of a knife could be made to penetrate this bone without much difficulty. Upon opening the cranial cavity in the usual way, the dura was found to be very adherent over a large extent of surface which corresponded exactly to the discolored and softened portion of the bone. By much exertion, however, the parts were forced, and the inside of the bone was found to be covered with the same peculiar growth as the outside, and thicker.

The whole inner surface was extremely vascular. The dura was found very much roughened over the whole right half and this roughened appearance stopped sharply at the median line. The left half was normal in appearance. Upon endeavoring to remove the dura from the underlying structure it was found to have become firmly united over an extent covering the whole of the left half of the cerebrum, but by using considerable force, it was removed bringing with it portions of the underlying tissue. Upon examination there were seen covering this half of the dura, numerous thick and rough fragments of the growth, more of them appearing on the anterior portion than on the posterior; indeed the center of activity, so far as the bone and the membrane are concerned, appears to have been localized over the frontal convolutions. The cerebellar dura was normal. The other membranes appeared normal except in the locality above mentioned. Upon examining the brain itself, it was found to be normal in every respect, excepting the anterior half of the right hemisphere. Here in the area occupying all of the third and part of the second frontal convolutions and the anterior portion of the temporal lobe, are found very intimate adhesions, extending between them and a mass of tumor which pressed them forward and separated them from the underlying floor of the cranial cavity. The tissues here, both cerebral and neoplastic, were intimately bound together by numerous bands of connective tissue.

The cerebral substance itself, however, appears not to be involved and by a little force the tumor can be separated from the brain.

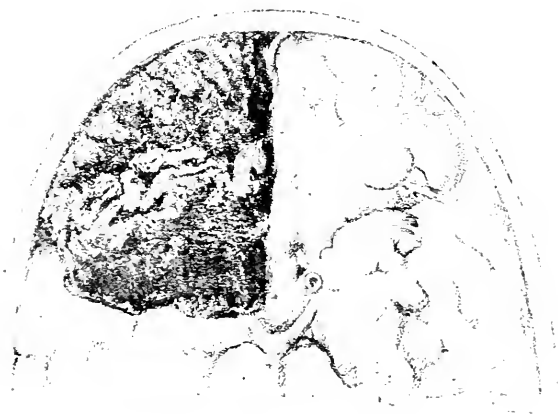


FIG. 1.—Appearance of the Tumor from a Drawing.



FIG. 2.—Portion of the Dura Mater Showing the Growth on its Surface.

By exerting a good deal of force the brain and tumor were removed from the cranial cavity, when it was found that the growth extended forward and outward into the orbit and that it had absorbed a portion of the roof of the same. The whole of the right side of the sphenoid bone, the right side of the

horizontal plate of the frontal, the anterior portion of the squamous part of the temporal, all were very much softened and involved by the new growth, which also extended along the course of the optic nerve into the orbital cavity which it completely filled.

This cavity was filled by a hard unyielding mass of tumor tissue, in which lay the stump of the right eye, which had at some time previous been the seat of panophthalmitis, as above stated. The orbital floor was also involved and the antrum Highmorii was also the seat of some of the tumor tissue and was filled with a semi-purulent fluid. The tumor itself is dark yellowish gray in appearance, very firm and resistant.

MICROSCOPIC EXAMINATION.

The microscopic examination was made by Dr. R. C. Heflebower.

Microscopically the tumor resolves itself into a fibro-sarcoma, in which the fibrous elements greatly predominate. In fact, the chief mass of the tumor is composed of bundles of fibrous tissue closely pressed together, with a sparse number of round cells more or less regularly arranged in rows running parallel to the direction of the fibrous tissue. As a rule, these round cells are of about the same size and appearance, but here and there may be seen cells assuming a spindle-shape, or a fully developed spindle.

In some parts of the tumor, however, the fibrous material is not placed in layers, but is formed by fibrous tissue curled and twisted together in a very irregular manner, and containing proportionately a larger number of round cells, than is found where the arrangement is more conventional.

In spite of the density of the tumor, there are numerous small vessels in every part of it, and these are all quite filled with blood. These are very simple in their structure, and consist of a thin, transparent wall, which separates the blood stream from the surrounding tissue. In that part of the tumor where there is a regular arrangement of the fibrous bundles,

the vessels also assume the general parallel course being, like the rows of round cells, interposed between the fibrous layers. In the irregular arrangement the vessels assume no definite course, and ramify with much greater frequency than in the other portion.

The ocular muscles present one of the most interesting microscopical pictures connected with the case. The sheath of the muscle remains comparatively unchanged, except that it is considerably thickened; but the general histological features are unaltered. The muscular substance itself, however, is entirely unrecognizable, and its place occupied by the tumor in the round and spindle-celled form. The round cells here are a trifle larger than in the tumor proper, and every form of transition from round to spindle-cell is clearly shown. The fibrous material is very scarce, and occurs mostly at some point near the muscle sheath.

Vessels are also numerous in the muscle, but present the same appearance as in the general tumor-mass, except that they are larger, their calibre more irregular, and the histological arrangement of the wall more clearly defined. In places, branches of the nutritive vessels of the muscle can be seen, with walls enormously thickened and infiltrated with cells of both the round and spindle variety.

Nowhere, however, can any trace or suspicion of muscular tissue be found.

REMARKS.

There are some interesting points in relation to this case and the first one I would mention, is the apparent arrest of the forward growth of the tumor: At the time of the patient's death the orbit was filled with a nodular mass of very hard and inelastic consistency. It was not painful to pressure. During the last eight months of the patient's life the orbital portion of the tumor grew *very* slowly, but it is probable that that portion behind the orbit advanced steadily. The general constitutional symptoms were very severe and the pain so acute that

for months liberal doses of morphine had to be administered. Bramwell says "that slow growing encapsuled sarcomata produce atrophy rather than irritation of the brain tissue with which they come into contact; in such cases the general symptoms may be very severe, but in localizing indications slight or altogether absent."

The functions of the brain here were not interfered with in the least, but the brain tissue in contact with the growth was altered by mechanical pressure. The very pronounced softening of the roof of the orbit and of the right side of the sphenoid and the right side of the horizontal plate of the frontal and the anterior portion of the squamous part of the temporal would indicate that, if the tumor originated in the orbit, it perforated the bone very soon and then invaded the surrounding bony tissues.

ON TROPA COCAINE, THE LOCAL ANÆSTHETIC.

BY ADOLF ALT, M.D., ST. LOUIS.

The new alkaloid, according to *Merck's Notes on New Remedies* (December, 1892), was isolated by Giesel from the narrow-leaved coca plant of Java. Liebermann who examined it chemically pronounced it to be benzol-pseudo-tropeine. By hydrolysis it was decomposed into benzoic acid and pseudo-tropeine, the latter body being chemically identical with the pseudo-tropeine from *hyoscyamus niger*. Its close connection with the tropeine group and atropine, concerning which Ladenburg's clinical researches have discovered so much, was established. The reconstruction of the alkaloid under consideration from its products of decomposition, benzoic acid and pseudo-tropeine, in the same way as cocaine is prepared

from benzoic acid and ecgonine, also recalls its relation to the latter alkaloid. To avoid the cumbrous systematic name, and to recall its chemical relations as well as its occurrence in a coca species, the name tropa-cocaine has been given to it.

Chadbourne's experiments on animals and his experience as well as that of Schweigger, Silex and others, on human subjects have shown that tropa-cocaine is a powerful local anæsthetic. Its action resembles that of cocaine, but it is not identical with it. It does not cause the ischæmia of true anæsthetics like cocaine, nor the irritation and hyperæmia of Liebreich's group of anæsthetics. Compared with cocaine, tropa-cocaine is much less toxic, since it exerts much less of a depressing action on the cardiac motor ganglia and on the heart's muscle. Local anæsthesia is completed much more quickly and continues longer (? Edit.). In the eye hyperæmia is occasionally caused by it, but it quickly disappears; mydriasis occurs, but not as a rule, and it is always less than after cocaine. In ophthalmic practice, tropa-cocaine appears in most cases equal to, and in some superior to cocaine. At any rate it appears to have a great future in this direction. Those who have tried it, prefer its employment in the removal of foreign bodies from the cornea. Schweigger did a painless iridectomy in less than two minutes after the instillation of tropa-cocaine, and a tenotomy within half a minute after, which was reported as painless.

The solution used in the experiments described above seems always to have been one of three per cent. It is, furthermore, claimed for this solution that it has a slightly antiseptic quality and that its anæsthetic action does not spoil with age, as it is said of cocaine-solutions.

Through the kindness of my friend, Dr. O. Curtman, Professor of Chemistry in the Missouri Medical School, I received fifteen grains of hydrochlorate of tropa-cocaine, which was generously given for experimentation by the owners of the Mallinckrodt Chemical Works of St. Louis and New York.

A three per cent. solution of this salt I have for a month used in my practice in all cases in which I have been accustomed

to instill cocaine. The results of these experiments are the following:

The instillation of one drop of this solution causes in the vast majority of the patients momentarily a very pronounced irritation, with considerable hyperæmia of the blood-vessels, and sometimes pain and profuse lachrymation. These symptoms, although in themselves trifling, are so different from the sensation which a four per cent. solution of cocaine produces, that most of my patients spontaneously asked, what new medicine I had instilled.

Total anæsthesia of the conjunctiva and cornea is reached in some cases in half a minute in others it takes a minute or more. When no second drop is instilled this anæsthesia begins noticeably to wane after about six minutes, but is rapidly re-established by a new instillation.

I have never seen any general toxic symptoms from repeated instillations and subcutaneous injections.

Foreign bodies can be quickly removed from the cornea after the instillation of one drop of the solution.

The application of caustics to the conjunctiva causes less pain than it does after cocaine, neither does the pain seem to last as long.

In operations on the eyeball my experience has not been as brilliant as that of former experimenters. Several patients on whom I made tenotomies of the external muscles felt the pain very keenly when the tendon was cut. In iridectomies the cutting of the cornea was painless but the cutting of the iris was felt painfully. I used tropa-cocaine in one case of simple cataract extraction and I shall not use it again. The hypotonus which is produced by cocaine anæsthesia, I have always looked upon as a great help in cataract extraction and a barrier against prolapse of the vitreous body. In this case of cataract extraction with tropa-cocaine no hypotonus existed, rather perhaps an increase of tension, at any rate the easy expulsion of the lens was at once followed by a small prolapse of the vitreous body, an accident which has not occurred to me in years. In several cases of ulcers of the cornea the

galvano-cautery seemed to be felt more painfully, than with cocaine.

Tropa-cocaine is, from all this, undoubtedly a strong local anæsthetic. However, I do not see that it is greatly superior to cocaine in ophthalmic practice, unless it be for its quickness of action. In surgical operations where local anæsthesia can be produced by repeated subcutaneous injections its comparative freedom from toxic properties is likely to render it more valuable than cocaine.

The price of tropa-cocaine is given at \$5.00 per gram (grs. 15), which in comparison with the small advantages which it has over cocaine, is rather against the general use of this drug.

A CASE OF RECURRENT EPITHELIOMA FINALLY
REMOVED BY GALVANO-CAUTERY. NO
RELAPSE AFTER THREE YEARS.
PREVIOUS TO THIS, SYMPA-
THETIC NEURO-RETINITIS.

BY ADOLF ALT, M. D.

The history of F. D. B., aside from the epithelioma of the cornea and as far as I have had occasion to observe the case, is interesting enough to report it in full.

On April 19, 1881, F. D. B., a Pullman car conductor, 38 years old, consulted me for the first time on account of dimness of vision in his left eye and pain in the phthisical right eye. The right eye had been lost 25 years previously by an injury which was followed by a severe, painful and long continued inflammation, finally ending in phthisis of the eyeball.

On the remaining stump he had worn an artificial eye which was not well borne and had frequently to be removed on account of new inflammatory attacks. With the last inflammatory attack, which had begun ten days previous to his visit, vision in his left eye had become blurred and was now reduced to $\frac{20}{L}$. This eye showed a marked degree of optic neuritis and retinitis, the pupil acted sluggishly and there was photophobia, photopsia and lachrymation. This evident sympathetic neuro-retinitis was cut short by the prompt enucleation of the painful and shrunken right eyeball. On April 29, vision $\frac{20}{XXX}$, and all other symptoms had disappeared except a slight tortuosity of the retinal veins. The enucleated eyeball contained a small piece of stone embedded in a cyclitic membrane. In the detached retina I found three cysts.

On May 29, F. D. B. called on me again on account of blurred vision. I found V. = $\frac{20}{LXX}$, disk and retina hyperæmic, and a keratitis in stripes. He had been wearing an artificial eye since the removal of the stump. The artificial eye was now removed and leeches to the left temple were applied, iodide of potassium given internally and the patient was kept in the dark. Under this treatment all symptoms disappeared again and vision rose to $\frac{20}{XXX}$.

On November 21, 1886, F. D. B. called on me again on account of a small growth at the corneo-scleral margin in the lower outer quadrant, which he had observed growing slowly for about five months. It now seemed to interfere with vision. The tumor, which was quite vascular, was about as large as a small split pea, and two-thirds of it lay on the sclerotic, while about one-third encroached upon the corneal tissue. I removed the tumor with the knife. On examination it proved to be an epithelioma. (Patient was then 43 years old). The wound healed readily, and he was ordered to call from time to time to be examined, which he did for about six months. During this time a slight vascularity around the scar was all that could be seen. He did not put in an appearance again until May 19, 1888. I now found a flat tumor which grew altogether on the cornea, and was but slightly larger than the

corneal portion of the original tumor. I again dissected it off carefully and scraped the wound-surface. The patient was in a very bad condition generally, looked cachectic and complained of pain in the abdomen. The liver was considerably enlarged. On account of this condition he had given up work and was going to take a rest. I supposed it would soon be a final one. The wound from the operation healed very promptly.

On May 25, 1890, he returned very considerably improved in his general health, but with the corneal tumor grown again. The flat, somewhat vascular tumor, now covered the lower outer quadrant of the cornea and encroached sufficiently upon the pupillary area to interfere with vision. I now decided to remove the tumor by means of galvano-cautery, to which he promptly consented. The burn was, of course, quite extensive, and during the healing period his sight was very poor; but after the healing was complete sight was considerably improved. I have seen him a number of times since, the last time a few weeks ago, when he came to get new glasses correcting his presbyopia. There is now no sign of any former trouble. The localized injection which had remained after every previous removal has totally disappeared; the cornea is so clear that only with oblique illumination a slight dimness in the lower outer quadrant can be made out. Vision with $+1 D = \frac{20}{xx}$. His general health seems to be satisfactory.

Judging from a number of similar cases, some of which I have, however, not been able to observe for so long a time, I am satisfied that galvano-cautery is the best means we have in hand to remove corneal and episcleral tumors lastingly, although I have, like others, perfectly succeeded in a number of cases with the knife.

CORRESPONDENCE.

ARTIFICIAL EYE-SHELL.

Editor AMERICAN JOURNAL OF OPHTHALMOLOGY.—The following may be of interest to you and the readers of your valuable journal. In your March number, 1886, is an article from Dr. Pooley, of New York, regarding the use of an artificial eye-shell, made of glass, in symblepharon. I presume further use of this appliance has been reported upon in other cases, but I have failed to note them. At the time of reading the doctor's article, I had already planned a somewhat similar procedure. It came in a little different manner. It was not to correct a symblepharon, but to prevent one. The method exceeded my expectation, and is new as far as the writer knows.

A farmer was sent by a neighboring physician for treatment of an inflamed right eye, supposed to be due to a cold.

After two days of observation, for there was absolutely no history, the diagnosis, infection from kine-pox, was fully established, and several physicians concurred in this opinion.

The characteristic pustule developed upon the far edge of the lids and the external surfaces of the upper lid. The mucous surfaces of the lids and eyeball were studded with vesicles. The cornea however was intact, and vision was not impaired. Ordinary treatment was pursued for three days. During this time the vesicles ruptured with consequent general adhesions of the lids to the eyeball. These were broken up at frequent intervals, and an elevator given the friends to use as often as possible. The surfaces became raw, granular, bleeding and

enormously swollen. Necrosis of the cornea was imminent and probably enucleation. At this time the following procedure was adopted: A dentist was called in, who made a cut of the eyeball as near as possible, and upon this a vulcanized rubber shell was made. So much of the shell as corresponded with the cornea was removed, leaving a collar which was inserted with instructions to remove the shield twice a day, for the purpose of cleansing both, the eye and the instrument. In ten days there was no further use for the shield and the patient has made a complete recovery free from adhesions. Passing the suggestion that will readily occur to any expert I think it safe to say that the eye is more tolerant of rubber than glass; that it is quickly available and at small cost, and further, that it is not necessary to keep an assortment. Very respectfully,

Oshkosh, Wis., May 3, '93.

W. H. SEARLES, M.D.

ARTIFICIAL EYES.

EDITOR AMERICAN JOURNAL OF OPHTHALMOLOGY.—We beg to inform you, that our Mr. A. C. Müller of the Firm of F. Ad. Müller Söhne, manufacturers of artificial eyes, Wiesbaden, Germany, will be at Chicago from the 5th of July to the 1st of October, a. c., for the purpose of making artificial eyes directly from nature. His residence will be in the house of P. R. Welcker, M. D. 2459 Prairie avenue; telephone, South 917.

Our artificial eyes are universally known and appreciated.

Our principal aim is to manufacture artificial eyes directly from nature; to obtain such eyes the patients generally come here to Wiesbaden or call on us, by order of their oculist, during the tour, which one of the chiefs of the house makes every year through Germany and the principal cities of the continent.

On these tours we carry all machines and materials necessary to manufacture artificial eyes and we are, therefore, able to guarantee to the patient, even in the most difficult cases like difformity of the orbit by a burn, or injury, a perfectly fitting eye.

The eye is made in the patient's presence and for its manufacturing only a few hours are required.

In consideration of the above mentioned facts, we beg to call your attention to Mr. Müller's presence in Chicago.

You may be sure. Mr. Müller will do his best to merit the honor of your recommendation by a conscientious standard work.

You are kindly invited to visit the ambulant eye-factory which will be of especial interest to you as an oculist.

Yours Respectfully F. AD. MÜLLER SÖHNE.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, MAY 4TH, 1893.

HENRY POWER, M.B., F.R.C.S., President, in the Chair.

A PECULIAR CASE OF MEMBRANOUS CONJUNCTIVITIS.

Dr. Bronner (Bradford) read notes of the case of a man aged 43, who had been the subject of recurrent attacks of iritis. After a recent attack the lids of the right eye became swollen, red and œdematous, and there was muco-purulent conjunctival discharge. When next seen a thick greyish-white membrane was found adherent to the conjunctival surface of both lids, which covered the eyeball anteriorly, although not adherent to it, and closed the palpebral fissure. On puncturing the membrane, a thick yellowish fluid escaped. Bleeding occurred when the membrane was separated from the lids. The ocular conjunctiva was red and somewhat swollen, and there was some peripheral ulceration of the cornea. The membrane reformed after one removal, but on detaching it a second time and applying nitrate of silver to the conjunctiva no further membrane developed. The ulceration of the cornea was cured by the use of the galvano-cautery. There was no history of diphtheria, croup, or gonorrhœa, and no characteristic micro-organisms could be found in the membrane.

THE RELATION BETWEEN VISUAL ACUITY AND VISUAL EFFICIENCY.

Dr. G. A. Berry (Edinburgh) read this paper. He pointed out the varying degree of visual acuity required in carrying out different trades, apart from the superfluous acuity brought into play in the general relations of life. Where sight was injured the loss to the individual was not always commensurate with that found by the ordinary standard of subjective examination. Taking the average acuity of the two eyes as expressing the amount of vision, Zehender regarded the total loss of one eye as reducing the vision to $\frac{1}{2}$, and not to $\frac{1}{4}$. The author considered that for a given amount of loss the distribution of visual defect over both eyes was less disadvantageous than its concentration in one, and in this he differed from Zehender. The advantage which bilateral vision possessed over unilateral, even when partial, consisted in (1) the greater area of the field of vision; (2) the better appreciation of the third dimension; (3) the smaller risk of complete blindness. Dr. Berry estimated that the loss of accurate appreciation of the third dimension crippled vision to the value of at least $\frac{1}{6}$. The limitation of the field by loss of one eye might be estimated at a similar amount, together amounting to Zehender's estimate of $\frac{1}{4}$. In complete homonymous hemianopsia the loss was not actually 50 per cent., but about the same as the loss of one eye, namely, $\frac{1}{2}$.

PASSAGE OF LEADEN PELLET THROUGH EYEBALL WITH RETENTION OF PERFECT SIGHT.

Mr. Simeon Snell (Sheffield) related this case. A youth had been shot in the right eye by a pellet from an air gun, the wound of entrance being in the sclerotic, on the nasal side, above the insertion of the internal rectus. When seen two hours after the accident, some vitreous had escaped through a round hole about four millimetres in diameter in the sclerotic, and the interior of the eyeball was filled with blood. Next

day the eye looked better. The vitreous cleared, and a hæmorrhage close to the optic papilla underwent absorption, disclosing a pigmented scar (wound of exit). Vision soon improved, and reached $\frac{6}{18}$ and J. 1. The ophthalmoscope revealed a large atrophic area with pigment, especially at the edges, in the position of the wound in the sclera through which the pellet entered, and there was a corresponding gap in the perimetric chart. The place of exit was, as indicated, close to the disc. The date of accident was August 30, 1892, and the sight remained good at the time of writing.

NÆVUS OF THE PLICA SEMILUNARIS AND TWO CASES OF NÆVUS OF THE CONJUNCTIVA.

Mr. S. Snell related these cases: (1) A girl, aged 20, was the subject of nævus of the lip (left) inside of the mouth and the palate. She had been born with it in her lip. For this she had undergone successful treatment. The appearances in the eye only came on two years ago. The nævus in the plica was about the size of a small bean; it projected somewhat between the eyelids; the caruncle was not much affected, but showed some enlarged vessels on its surface. The tumor was painted with ethylate of sodium with marked success; it indeed disappeared. (2) A baby, aged $4\frac{1}{2}$ months. The conjunctiva was involved by a series of nævoid vessels on the upper and inner side; associated with this was a nævus in the orbit at the upper and inner angle. The conjunctival nævus was treated with ethylate of sodium with good effects: not only was the conjunctival part greatly benefitted, but the orbital nævus appeared also decidedly improved. (3) A woman, aged 30, with a history of injury—a poke with a pointer in early childhood. The present tumor had existed for a long period, but it was uncertain if it had got worse lately. Above the cornea, involving and really under the conjunctiva, was a rounded nodulated tumor like a blackberry in size, color and form. It was of a dull livid color, brighter at parts. It was dissected out; it was found to be an angioma with a good deal of fibrous tissue;

two small calcareous nodules were found in it. (Water-color drawings of these cases were shown).

TWO CASES OF BLINDNESS, ONE BILATERAL, RESULTING FROM FACIAL ERYSIPELAS.

Mr. Snell also read particulars of these cases. The first occurred in a man, aged 48. The attack had chiefly affected the left eye and side of face. As the erysipelas subsided the left eye was found to be blind. When seen at the end of five weeks the left optic papilla was hazy and pale, and the arteries small; there was no perception of light. The other case was in a man, aged 53. The erysipelas affected both sides of the face and right arm; there was a good deal of swelling about the face and eyes. When he was able to open his eyes he found himself quite blind. When seen ten weeks later, not the faintest light perception existed in either eye; both pupils widely dilated; papilla on left side smudgy and passing into atrophy; arteries perceptibly lessened in calibre; veins less altered; right optic disc partly covered by a hæmorrhage, but was apparently undergoing the same changes as the left. At a later date extensive hæmorrhages took place into left vitreous, which prevented details of the fundus being noted; in the right the disc was ill-defined, owing to a hæmorrhage partly covering it; a vessel which could be traced a little way from the disc was filled with dark blood; very few vessels were visible; those seen looked like lines, some dark looking hæmorrhages were visible in the retina at the periphery, and some in the vitreous also. Mr. Snell remarked that there appeared to be (Knapp) in all cases in which blindness came on during the erysipelatous attack, evidence of orbital cellulitis, however slight. It probably occurred in these cases. He thought that pressure by the orbital tissues was not always enough to account for the conditions found. Possibly the peculiar poison of erysipelas promoted a condition of the vessels favorable to the formation of thrombi.

DOUBLE OPTIC ATROPHY FOLLOWING ERYSIPELAS OF ONE
SIDE OF THE FACE.

Dr. Scougal (Huddersfield) recorded this case, which occurred in a man aged 60. There was no direct evidence of orbital cellulitis, no brawniness of the affected area, which comprised the right malar, supra-orbital and temporal regions. There was no affection of vision during the erysipelas, no complaint being made till five weeks after. The case was peculiar also, because while the erysipelas was one-sided, the atrophy was double. Dr. Scougal had not been able to find any similar case recorded. The absence of any sign of orbital cellulitis was also noteworthy, as Knapp¹ stated his belief that in all cases of amblyopia following erysipelas cellulitis had occurred. The prognosis of such cases, as regarded recovery of vision was not at all hopeful.

Mr. Hill Griffith (Manchester) asked if the optic atrophy might not be independent of the erysipelas, and inquired if there were any symptoms of spinal cord or brain disease.

Mr. Snell thought Dr. Scougal's case scarcely belongs to the ordinary class of cases in which optic atrophy was caused by erysipelas.

Dr. Scougal, in reply, said that his patient was a perfectly healthy man, and had no symptoms of spinal cord disease. He suggested that optic neuritis might have been present during the erysipelatosus attack, but that no defect of vision was evident till the nerves became atrophic.

TWO CASES OF COMPLETE DETACHMENT OF THE CHOROID.

Dr. Mules (Manchester) read brief notes of these cases. The first occurred in a boy aged 12. The separation of the choroid was complete; this was verified by dissection after removal of the globe. No cause for the condition was discovered. The second case was that of a youth aged 19, whose eye had been injured by a poke with a finger. The eye was not removed. The case differed from those previously recorded in

that in the first the vascular system of the choroid could not be seen at any time, although the media were clear; the appearances were thought to be those of white sarcoma. In the second the choroidal vessels were visible at first, but were afterwards obscured by lymph, and then closely resembled the first case.

PYRAMIDAL CATARACT.

Dr. Mules also reported a case of pyramidal cataract, in which lymph bands stretched from the apex of the opaque cone to the edge of the corneal scar. These appearances persisted for sixteen months, at which time the eyeball was excised.

LIVING AND CARD SPECIMENS.

Mr. S. Johnson Taylor, Intraocular Growth of Unusual Nature; Messrs. Hartridge and Griffith, Microscopic Sections of Leucocythæmic Retinitis; Mr. A. S. Morton (1) Case of Persistent Membranous Conjunctivitis; (2) Hereditary Nightblindness without Ophthalmoscopic changes; Mr. Adams Frost, Coloboma of Iris and Choroid on Temporal Side; Mr. Doyne, Drawing of Changes in the Macular Region after Injury to the Eye by a Chip of Metal.

NEWS.

MEETING OF THE AMERICAN MEDICAL ASSOCIATION AT MILWAUKEE.—SECTION OF OPHTHALMOLOGY.

The following program is announced :

1. Pannus and Its Treatment by Digestive Ferments, by J. A. Lydston, Chicago.
2. Hypertrophic Conjunctivitis and Its Treatment, by Cornelius Williams, St. Paul.
3. Phlyctenular Ophthalmia, by Dudley S. Reynolds, Louisville.
4. The Total Correction of Refractive Errors, by W. F. Coleman, Chicago.
5. (a) History of a Case of Successful Extraction of a Piece of Steel from the Vitreous by Aid of the Electro-Magnet. (b) Study of a Case of Hæmorrhagic Glaucoma and Microscopic Sections, by Chas. A. Oliver, Philadelphia.
6. Glaucoma, by L. F. Love, Philadelphia.
7. Unilateral Neuro-Retinitis, With Report of Cases, by B. L. Milliken, Columbus, Ohio.
8. Tobacco Amblyopia, by F. Dowling, Cincinnati.
9. Sympathetic Ophthalmia, by A. Hobby, Iowa City.
10. A Study of the Etiology of Blindness of Pupils in the Various State Asylums, by G. F. Keiper, Lafayette, Ind.
11. Skin Grafting in Malignancy of the Eyelids and Orbit, by Flavel B. Tiffany, Kansas City.
12. Treatment of Granular Lids; Exhibition of Instruments, by C. B. Blubaugh, Parkersburg, W. Va.

13. Exostosis of the Orbit, by Robert F. LeMond, Denver.
14. Some Rare Forms of Tumors of the Orbit and Eyelids, by J. Schneider, Milwaukee.
15. Strabismus Convergens, When and how shall We Operate? by S. C. Ayres, Cincinnati.
16. Rapid Dilatation of the Lachrymal Sac, by S. L. Ziegler, Philadelphia.
17. Cataract Lenses, by H. V. Wurdemann.
18. Albinism of Eyes, by G. G. M. Gould, Philadelphia.
19. Commentaries on Diseases of the Lachrymal Passages, by H. Gradle, Chicago.
20. Posterior Sclerotomy as a Preliminary to Some Operations for Glaucoma, by H. Gifford, Omaha.
21. Two Cases of Brain Tumor, Where Optic Neuritis was the Only Positive Sign; Autopsies, by E. P. Morrow, Canton, Ohio.
22. The Curvilinear Reflection of Weiss as a Prodromal Sign of Myopia, by B. Alex, Randall, Philadelphia.
23. Intra-Ocular Injections of Various Antiseptics, by G. E. DeSchweinitz and H. A. Aare, Philadelphia.
24. Purulent Ophthalmia from the Standpoint of Specific Microbe Cause, by A. Hare, Chicago.
25. Relation of Diseases of the Upper Air Passages to Diseases of the Eye, by J. G. Carpenter, Stanford, Ky.
26. A Case of Sympathetic Neuritis after Evisceration, by F. C. Hotz, Chicago.
27. Treatment of Nasal Duct Obstruction, by Casey A. Wood, Chicago.
28. (a) The Best Form of Rod and Rotary Prism Tests with a New Phorometer; (b) Classification of Diseases of the Eye in Hospital Statistics, by E. Jackson, Philadelphia.
29. Squint and Its Treatment, by J. H. Thompson, Kansas City.
30. The Artificial Ripening of Immature Cataracts, by B. Bettman, Chicago.
31. Meningitis Following Enucleation of the Eyeball, by S. D. Risley, Philadelphia.

32. Legislation in the United States for the Prevention of Blindness, by L. Howe, Buffalo.

33. The Results of the Use of the Electromagnet for the Extraction of Foreign Bodies, by C. Barck, St. Louis.

34. Quiescent Foreign Bodies Within the Eyeball, by W. B. Johnson, Patterson, N. J.

35. Some Practical Experiences with Muscular Anomalies, by T. E. Murrell, Little Rock, Ark.

36. Persistent Spasm of the Accommodation Relieved by Tenotomy of the External Recti, by A. R. Baker, Cleveland.

37. Cataract Extraction in a Negro said to be 116 Years Old, by F. Trester Smith and B. F. Travis, Chattanooga, Tenn.

38. The Practical Value of the Ophthalmometer in the Measuring of Astigmatism, by L. J. Lautenbach, Philadelphia.

39. Pterygium—Presentation of Instruments, by A. Blitz, Indianapolis.

40. Dendritic Keratitis, by W. H. Wilder, Chicago.

Papers without title promised by T. Y. Sutphen, Newark, N. J., and E. G. Gardiner, Chicago.

AMERICAN OPHTHALMOLOGICAL SOCIETY.

The twenty-ninth annual meeting of the American Ophthalmological Society will be held this year on Wednesday and Thursday, July 19 and 20, at the Fort Griswold House, New London.

Yours very truly,

S. B. ST. JOHN, Secretary.

SELECTIONS.

TUBERCULAR IRITIS AND ITS TREATMENT.

G. E. DE SCHWEINITZ, M.D.

Tuberculosis of the iris, as generally described, occurs in the form of miliary growths (disseminated tuberculosis), or as a single neoplasm (solitary tubercle). The disseminated variety, consisting of the development of small grayish, translucent bodies, may be confounded, so far as its clinical characteristics are concerned, with nodular formations in the iris of non-tubercular origin,—the granulomata of some authors,—or with the deposits which have been occasionally seen in leukaemia, or have arisen under the inflammatory action caused by a foreign body entering the anterior chamber. Finally, it may be difficult to differentiate them from syphilitic papules, although the latter are crossed by blood-vessels, while in tubercles these are absent or but sparsely present.

The absolute diagnosis of tubercle of the iris would seem to depend upon bacteriological examinations and the demonstration of the bacilli characteristic of the disease, or upon inoculation experiments performed on rabbits' eyes. Some recent communications, however, maintain that the relation of tuberculosis to disease of the iris is much more common than we have been led to suppose, and the crucial test of finding the specific product of tubercle is not necessary to establish the identity of the disease, because in a number of instances, in the absence of the bacilli, the subsequent conduct of the affection, as well as general examination, have cleared away

all reasonable doubts as to the nature of the morbid process in the iris. At least one author is willing to ascribe a tubercular origin to many examples of chronic iritis, with moderate or severe inflammatory manifestations, accompanied by the depositions of precipitates on the posterior layer of the cornea.

Disregarding for the moment those cases which are of doubtful character, and returning to such forms, either disseminated or solitary, which with reasonable certainty may be diagnosed as tubercular, the important problem for solution is the best method of treatment. Some years ago Dr. Hill Griffith ("Transactions of the Ophthalmological Society of the United Kingdom," vol. x, p. 84), with this point in view, analyzed thirty-two cases of tuberculosis of the iris gathered from the literature, some of which were recorded as primary, although the accuracy of this designation is not entirely free from objection, because, as Fuchs maintains, although tuberculosis experimentally induced in animals is primary, when it occurs in the iris of man it is usually secondary,—that is, it arises from a tuberculous focus elsewhere in the body; a focus, moreover, which may be found, for example, in the glands, or may be inferred to exist in the intestinal canal, lungs or bones. In Griffith's list there were three cases in which no operation was done, the first two dying of general miliary tuberculosis three and five weeks respectively after the onset of the eye-affection, and the third with symptoms of tubercular meningitis nine weeks after the beginning of the disease. Two cases, in spite of enucleation, died with symptoms of brain disease after the removal of the eye, but these are the only two deaths among twenty-seven cases in which the bulb was enucleated. Griffith further shows that iridectomy has not been productive of favorable results; in eight cases in which this operation was tried enucleation was required later on. Hence, it is evident that if an operation is to be undertaken for tubercular disease of the iris, which, as he expresses it, is justified when the eye is practically lost, when there is danger of sympathetic ophthalmitis, or when the affection is rapidly progressive, this

operation should consist of enucleation and not of iridectomy.

When it comes to dealing with cases in which the diagnosis is doubtful, or there is no tendency to speedy increase, or even if the nature of the malady is reasonably certain, the vision is not lost, and its manifestations are moderate, operation should be deferred and an expectant plan of treatment be pursued. Naturally the ordinary hygienic measures suited to tuberculosis suggest themselves; and among the medicinal agents, if the report of C. Quint (*Centralblatt f. prakt. Augenheilkunde*, March, 1893), is to be trusted, creosote should find a prominent place. This observer, who is of the opinion that many cases of chronic iritis are really tubercular in nature, reports two examples of probable tubercular iritis greatly benefitted by the exhibition of creosote. In the first case, lasting three-quarters of a year in spite of various remedies (mercury, iodide of potassium, and salicylic acid), an iridectomy was performed, and the excised piece of iris planted in the anterior chamber of a rabbit's eye, resulting in three weeks in typical iris tuberculosis. The patient was then placed upon creosote in pills, beginning with .3 gramme (5 grains), and later .75 gramme (12 grains), p. d. After the use of 10 grammes (150 grains) during two weeks, improvement began; four weeks later, 30 grammes (450 grains) having been taken, improvement was marked, and at the end of five months the eyes were quiet, and vision in R. $\frac{1}{3}$ and in L. 1. At the time of the report no relapse had taken place.

The second case, which occurred in a woman aged fifty-two years, presented appearances similar to the first one,—namely, yellowish deposits in the posterior layer of the cornea, which decidedly increased as time went on, moderate iritis, and, finally, intense streaky opacity of the cornea, the visual acuity sinking to the perception of the movements of the hand at three metres. The increase of the disease occurred in spite of the administration of mercury and other remedies. Therefore creosote was exhibited, and at the end of four weeks, during which time twenty-five grammes (375 grains) of the drug had been consumed, a very favorable change took place.

The eye was nearly free from irritation, the deposits thinner and diminished in number, and the blood-vessels shrunken. At the time of writing, three-quarters of a year after the beginning of the disease and one-half year after the creosote treatment had been begun, the eye had been for a long time free from inflammatory symptoms, and the acuity of sight had increased to ¹ IV.

The reporter attributes the favorable result in these two cases to the creosote. In one tubercular iritis was proven by the inoculation experiment; in the other Quint believes it undoubtedly to have been present, in spite of the absence of experimental or other exact evidence on account of the symptoms, which were closely analogous to those in his first case. He records the two cases and this experience with creosote in the hope that others may be induced to try the remedy, and may also report their results. In regard to the first case, if the inoculation experiment was carefully performed, there seems little doubt that the disease was truly tubercular, and as all manner of other remedies had first been tried and had failed, it is fair to attribute the success to the creosote. In the second case there may be reasonable doubt of the real tubercular nature of the malady, but none the less it also first showed evidence of improvement under the influence of creosote administrations, and this after other remedies had been faithfully tried. The use of this drug in pulmonary tuberculosis has attained a fair reputation, and consequently there is every reason to test its efficacy in those cases of iritis the clinical symptoms of which bring them into relation with tubercular disease.—*Therapeutic Gazette*.

TWO NEW OPERATIONS FOR OBSTRUCTION OF THE NASAL DUCT, WITH PRESERVATION OF THE CANALICULI, AND AN INCIDENTAL DESCRIPTION OF A NEW LACHRYMAL PROBE.

BY G. W. CALDWELL, M.D.,

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With the treatment by slitting a canaliculus and slow dilatation with probes, obstruction of the lachrymal duct is notoriously obstinate and painful. It has even been held by a prominent oculist that a perfect cure never occurs, and that in many cases the last condition is worse than the first. Recent studies have demonstrated the existence of circular and triangular muscular fibers about the canaliculi, which, assisted by the contractions of the orbicularis and the capillarity of the tubes, are sufficient to effect the normal drainage of the conjunctival sac. By slitting the canaliculus this physiological process is supplanted by a simple gravity drain, and drainage is never thereafter quite perfect, even if the nasal duct is dilated to such a size that were it a matter of simple drainage a gallon of tears might flow through in an hour. In health the capillary tubes of the canaliculi are sufficient to carry away the tears, yet if one of them is destroyed by slitting, it is usually thought necessary to dilate the nasal duct to many times its normal size in order to secure any sort of drainage. It is reasonable to suppose that the preservation of normal function of the canaliculi is of far greater importance than an excessive capacity of the nasal duct. While it may be true that a few dry skulls have bony nasal ducts large enough to admit the larger

Theobald probes, it is certainly a fact that scarcely any membranous ducts can admit them; and forcing them through, as advised by Theobald, "even if it fractures the bony canal," must be considered barbarous to say the least. That many false passages are made, every oculist who also examines the nose will be ready to admit. Gentleness is imperative in dealing with all membranous canals. This is as true of the lachrymal ducts as of the urethra, although ill treatment may not be so dangerous to life. By bruising a congested nasal duct a functional stricture may be changed into an organic one, and to that extent rough treatment is worse than no treatment. Hæmorrhage from the nose should never follow simple probing of the nasal duct. Each time it occurs, another contracting cicatrix is added to the stricture.

Many slight cases of epiphora require only dilatation of the canaliculi up to No. 3 probe, with possibly its passage through the nasal duct from the upper canaliculus without slitting. Usually, however, it is necessary to reach the nasal duct with larger instruments than the canaliculus can admit. In order to avoid the destruction of the canaliculus, which has so important a function in the drainage of the conjunctival sac, and for other reasons which will be apparent, I have operated with gratifying results in the following manner: A small probe being passed through the upper canaliculus well into the sac and held in position by an assistant, the tissues at the inner canthus are made taut by pressure against the side of the nose, and a small incision is made from the inner extremity of the inner canthus inward and backward directly into the sac upon the probe. A suture should be taken through the wall of the sac and the inner margin of the wound, the ends being left long for traction to facilitate the entrance of instruments into the sac in the subsequent manipulations. The nasal duct may now be explored, and the caliber, length, character, and position of strictures determined by means of the probes which I will describe further on. A stricture being found, it should be divided at once by any narrow probe pointed knife. If the edge be made rather dull, its service can be better limited to

the stricture. Two or three nicks are better than one deeper cut. Dilatation is carried directly up to No. 12 if the duct will admit it with gentle pressure, and the duct irrigated with antiseptic solution, as boric acid. If the stricture is slight, the sac may be allowed to close at once; if not, the wound should be prevented from closing by the insertion of an obturator made of a fragment of rubber tissue, while the stricture is dilated every three or four days until the wound in the duct has healed, when the sac wound may be freshened and closed by catgut sutures. The operation is done without pain under cocaine, a few minims of a four-per-cent solution being injected into the point in the inner canthus where the incision is to be made and used freely in the duct. In a few cases, when the inferior turbinated is small and high, it is possible to explore and dilate the nasal duct by way of the lower opening in the inferior meatus of the nose.

The probe referred to above is made according to my design by Tiemann & Co., and consists of a wire staff eleven centimetres in length, with a central plate for convenience in handling. On each end is a bullet-shaped tip one centimetre long, with conical point, parallel sides, and abrupt shoulder. The tips are graded in size, as are Theobald's probes, in successive numbers, each unit of which represents one quarter millimetre of diameter. The shoulders are intended to emphasize the qualities of an obstruction, while the length is sufficient to allow it to be retracted into and held by a stricture for the purpose of dilatation. A complete set comprises seven double-ended probes numbered from 1, the staff alone, to No. 14, the largest size. The advantages which I assert for this probe are that, while for the purpose of dilatation it possesses all the essential properties of Bowman's or Theobald's, it also affords the additional advantage that with it a diagnosis of the location, length (allowance being made for the length of the tip), caliber, and character of an obstruction may be accurately made. The small size of the staff avoids traction at the inner canthus and thereby lessens the pain. The entrance of the probe into the open space between the inferior turbinated

body and the outer wall is immediately indicated by the loss of resistance. It is not, therefore, necessary to carry it to the floor of the nose to be assured it is in the nasal space.

In preparing wet anatomical specimens I have observed that not infrequently the inferior turbinated body rolls upon itself in such a manner as to be in the course of a probe projected through the nasal duct. When we remember that the nasal duct is only a half to three quarters of an inch in length, the reasonable suspicion must arise that this anatomical arrangement may possibly account for some of those "very firm strictures which are occasionally encountered at the lower extremity of the duct," to overcome which probes of such extraordinary strength and length have been advised. In other cases the antral wall encroaches so far on the nasal space that an ordinary probe in its downward course impinges upon the outer wall at an acute angle, when, if the force is continued, the periosteum is lacerated and pockets are formed, which complicate the case. These accidents can hardly occur in the use of this probe, as its escape from the duct is immediately indicated, and we need not be seriously concerned about what the probe may encounter farther down. The accompanying sketch gives a fair representation of the instrument.

In those cases where, in spite of or on account of the long-continued passage of tremendous probes, the duct has become hopelessly closed by fibrous or bony growths, and in fractures, caries, and persistent dacryocystitis, and in all cases in which obliteration of the sac is usually practiced, it will be found that by tapping the nasal duct in the middle meatus the function of the tear duct may be preserved. This is best done by the electric burr after passing a probe into the duct as far as the stricture. The opening should be made at the seat of stricture as indicated by measurements, and enlarged upward as far as necessary. In the two cases of bony closure in which I have employed this operation a complete cure has resulted. The operation is so evidently preferable to ablation or obliteration of the sac that no argument is necessary in its support.

—*N. Y. Med. Jour.*

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ORIGINAL ARTICLES.

IRITIS AS A SYMPTOM OF BRIGHT'S DISEASE.

BY A. SCHAPRINGER, M.D., NEW YORK.

Read before the Mount Sinai Hospital Alumni Association of New York,
May 26, 1891.

CASE.—On October 28, 1890, I was asked to call on Mr. D. E., on account of a painful affection of his right eye which had set in rather suddenly the day before. I found the patient, a man about 35 years old, sitting up in a darkened room, his posture and the expression of his face revealing intense photophobia. Before I proceeded to examine his eyes he told me that he had been under treatment for the last three weeks by Dr. Louis Conrad for an affection of his kidneys and that when his eyes began to trouble him, Dr. Conrad had advised that I be consulted.

The lids of both eyes which were kept closed by the patient were not swollen. He complained of intense pain in his right eyeball. The pain did not radiate to the forehead or to any other of the surrounding parts. The right eyeball was ex-

tremely sensitive to touch and could not bear the slightest pressure exerted upon it during manipulation of the lids. This great tenderness and the intense photophobia present rendered the subsequent stages of the examination very difficult and prevented the latter from being made as exhaustively as would have been desirable. There was well marked œdema of the conjunctiva bulbi, but not associated with any change of the normal white appearance of this membrane. The cornea was clear, but the aqueous humor slightly turbid. No precipitate could be made out on the posterior wall of the cornea. The iris looked discolored and dull and the pupil was contracted, but regular in outline. An ophthalmoscopic examination or tests as to the acuity of vision could not be made. The patient said that when he opened his right eye, the left being covered by the hand, he saw objects as well as usually, but that a slight fog seemed to cover the field of vision.

Dr. Conrad who had been physician to the family of which the patient was a member, for more than fifteen years, told me subsequently that there was no history of syphilis in the case. The patient had come to his office three weeks before, complaining of headache and nausea and looking badly. The doctor immediately suspected Bright's disease which suspicion was confirmed by an examination of the urine.

The following notes concerning the urine were kindly given to me by Dr. H. Bosch, Dr. Conrad's partner. To both of these gentlemen I am indebted for professional courtesies.

Urine of straw color, clear. Specific gravity varying between 1011 and 1018. Microscopic examination revealed few granular and hyaline casts. With the heat and nitric acid test there was a precipitate of albumin occupying from one-fifth to one-third of the entire volume of the liquid examined. After filtering, the addition of sodium chloride and acetic acid, or of potassic ferrocyanide and acetic acid, produces a copious precipitate of peptone and hemialbuminose. The urine did not contain sugar. It gave a great deal of foam when shaken.

There was no appreciable hypertrophy of the heart according to Dr. Conrad's examination, a fact which induced the

doctor to make an unfavorable prognosis as to the length of time the patient could live, which prognosis, unfortunately, was to be fully verified. There was no general anasarca.

The treatment instituted by Dr. Conrad consisted in the administration of caffeine benzoate for stimulating the muscular fibres of the heart, potassium iodide, and for the headache, benzoic acid and occasionally bromide of potassium.

A local treatment for the eye I prescribed the instillation of a solution of atropia sulphate, gr.j to ʒss, every two hours.

When I visited the patient on the following day he had less pain in his right eye, the photophobia was also less and the œdema of the conjunctiva had diminished. The pupil had yielded to the action of atropia and I was enabled to make a cursory ophthalmoscopic examination. The optic disc was slightly swollen, its outlines were indistinct, the retinal veins were enlarged and tortuous. In the region of the yellow spot there was a faint indication of white discoloration in two or three spots.

Whilst the patient felt considerable relief in his right eye since the instillation of atropia, his left eye now began to trouble him in the same way as the right, but not to the same degree. There was photophobia, the eyeball was painful and very sensitive to pressure. The same objective changes presented themselves in this eye as in the other, such as chemosis, dulness and discoloration of the iris, contraction of the pupil, and haziness of the retina in the neighborhood of the optic nerve entrance, but all these changes were considerably less pronounced than in the other eye.

The instillation of atropia was now ordered for both eyes and the patient continued to stay in a darkened room. The eyes continually improved and were well in about six days. The faint white spots which I saw in the region of the macula of the right eye when I made the first ophthalmic examination, could not be discovered on subsequent examinations.

The patient's death occurred on December 6, 1890, about five weeks after the first onset of the eye trouble. I learned from Dr. Bosch that two weeks before the patient's demise the

sheaths of the extensor tendons of the right hand became inflamed. A few days before the end this inflammation subsided to be replaced by an attack of pericarditis to which the patient succumbed in a uræmic condition. No autopsy was made.

EPICRITICAL REMARKS.—In the text-books on ophthalmology the following general diseases are enumerated which may give rise to iritis: syphilis, scrofulosis, tuberculosis, rheumatism, gout, the acute infectious diseases and lastly, diabetes. Gonorrhœa is also mentioned as being able to cause metastatic iritis. Bright's disease is nowhere found included in this list. I would myself probably not have thought of a connection between the attack of serous iritis from which the patient was suffering and the nephritis which had already been diagnosticated by the family physician before the eye trouble began—the patient had also been seen in consultation by Dr. A. Jacobi—if I had not recollected a case published a few years ago by Leber, then of Goettingen, now of Heidelberg, in which iritis was observed in a young man 21 years of age who was suffering from Bright's disease.¹ Leber states that he had never seen or read of a similar case before, but he nevertheless unhesitatingly assumed a causal relation between the general disease and the local disorder. He justifies this assumption by relating a very instructive experience he had had with iritis caused by another general disease, viz., diabetes. The first case of iritis occurring in an individual suffering from diabetes was published by Henry D. Noyes, of New York, in 1869. When Leber, in 1875, prepared a paper on the diseases of the eye caused by diabetes, he himself had not yet seen a case of iritis caused by this disease, and not finding any other cases recorded in literature but the one published by Noyes, he expressed the opinion that the occurrence of iritis in the diabetic patient had only been a coincidence. His attention, however, having been directed to this matter, he was soon forced to acknowledge that the occurrence of iritis in diabetics was not

¹Von Graefe's Arch. f. Ophthalm., Bd. xxxi, Heft 4, p. 197.

merely accidental, and in 1883 when he published the paper first referred to, he had already made notes of no less than nine cases in which iritis had developed in diabetic subjects. Several French authors have also described cases of this kind and diabetic iritis has become a recognized variety of ocular disease.

From the above it will be seen that Leber was certainly justified in publishing his single case of iritis occurring in an individual suffering from Bright's disease, thus directing the attention of the medical public to this coincidence, and I trust that Leber's example will be considered an ample apology for the publication of my own case.²

Denissenko, who studied the microscopical changes to be found in the membranes of the eye in Bright's disease, published a paper on this subject in a Russian medical journal, of which the following abstract appeared in Nagel-Michel's "Jahresbericht" for 1883, (p. 420): In Bright's disease Denissenko found that the iris as well as the other tissues of the eye showed an imbibition with an albuminous liquid. This liquid was mostly to be found in the adventitious coat of the blood-vessels, especially in the space between the larger and the lesser iris circle. The changes which he observed did not exhibit an inflammatory character, and for this reason Denissenko proposes to substitute the term "Ophthalmia Brightica or Edematosa" for the one hitherto used of "Retinitis Albuminurica."

²The above was written more than two years ago. The only contribution to the subject in question I have since met with in literature is the case of "Ophthalmic Albuminuria" described in the May number of this volume of the AMERICAN JOURNAL OF OPHTHALMOLOGY, by S. Pollak, with the histological comments by A. Alt.

TRANSLATIONS.

THE OCCURRENCE OF MYOPIA AMONG SCHOOL CHILDREN.

TRANSLATED FROM THE GERMAN OF DR. HERMANN COHN'S
WORK ON "HYGIENE OF THE EYES."

BY DR. S. C. AYRES AND
PROF. J. REMSEN BISHOP, } CINCINNATI.

The influence of school life on the eyes is a question which has excited great interest in the medical and educational world since 1865-66, when Dr. H. Cohn, of Breslau, made his first extensive examinations of school children. He examined over 10,000 scholars in different grades, and then later on followed up the influence of school life, noting the increase of myopia from class to class. His statistics attracted great attention throughout Europe and in this country, and soon the good work which he began was taken up by numerous other men. It enlisted the interest of the most prominent men in the profession, and from that time to the present it has continued, until statistics relating to more than 200,000 scholars in various kinds of schools, colleges, seminaries and gymnasiums have been collected. This gives an idea of the immense amount of work done in this line. Statistics such as these are of great value and are worthy of credence. They teach lessons which may guide us in conducting the education of children, so as to avoid the dangers which necessarily surround them.

The advantages of this work are shown in the better construc-

tion of school houses. Compare the school houses of the present day with one of the old ones constructed say thirty years ago. Here a large percentage of the desks were arranged to suit the space in the room, regardless of the way the light would fall upon the desks of the scholars..

In the old school houses the window panes were very small, so that the cross pieces cut off much of the light so greatly needed in our smoky city. Some of these windows still continue to shed their obstructed light on the children's desks—and this is probably true of other cities.

There has also been a marked improvement in the construction of desks. The little tots no longer dangle their feet in mid-air without being able to touch the floor with even the tops of their toes. Desks now are comfortable and built to suit the various grades of physical development. But the most important result of this extensive investigation of the influence of school life on the eyes has been the general spread of intelligence on this point among laymen. At the present time all intelligent teachers in public and private schools, colleges and seminaries, have more or less information on the influence of school life in developing myopia. In fact the *teachers* often and, perhaps, generally first discover these defects and report them to the parents. This usually leads to an investigation and a correction of the ocular defect.

Children of the present day with optical errors, are able to study with ease and comfort, and more than this their eyes are so protected that they do not suffer from the ocular diseases incident to those optical errors.

Last year Dr. Cohn published a work entitled "Hygiene of the Eyes." There is much in it of interest to the medical man, but also much to the layman. Teachers, professors, parents, guardians, in fact all who are interested in the education of youth, will find in it a fund of information which is of great interest and value.

The book, after a brief description of the anatomy of the eye, discusses the acuteness of vision, errors of refraction, constitutional and acquired diseases which affect vision, and then

opens up the question of myopia, which is considered in a masterly way from any stand point. Statistics are collected from reliable sources and so treated that the influence of school life on the eyes of children is clearly shown. The effects of bad illumination—natural and artificial—the influence of ill-constructed desks, of badly arranged rooms, and many other allied questions.

The translators have given only that portion of the work which relates to the development of myopia among school children.

The exhaustive manner in which the question is handled covers every essential point of inquiry, and the thoroughness of research and the reliability of contributors to the statistics, render them of the greatest value.

"Myopia is a very widely spread disease. Among 40,000 patients that came into my clinic, 6,707 were short-sighted, that is 16.8%. Mooren observed among 108,416 patients 8,452, 7.8%, suffering from myopia.

A far better insight into the extent of myopia than reports from eye-clinics, is given as by researches among school children, and we possess in this regard materials which do not exist in such completeness in the case of any other disease.

Randall found in the examination of 167 reports that of 213-690 persons, examined only for the occurrence of myopia, 17.9% were short-sighted.

The first communications concerning the eyes of school children, so far as I can determine, were made by James Ware, in the year 1812. In a military school at Chelsea among 1,300 children, only three complained of short-sight. On the contrary, of 127 students in Oxford in 1803, there were not less than 32 who made use of lorgnettes or spectacles. "It is possible," adds Ware, "that several were led to the use of glasses by fashion, but their number is surely inconsiderable in comparison with those who really saw better through glasses."

Between 1840 and 1850, as Schurmayer relates, inquiries were made in the schools of the grand duchy of Baden, and

these revealed that of 2,172 pupils of the 15 learned institutions, 392 were short-sighted, that is $\frac{1}{5}$ th of all pupils. Among 930 pupils in the higher Burgerschulen 46 were found short-sighted, therefore about $\frac{1}{20}$. In the fifth and sixth classes (the highest) of the gymnasiums, 25 to 50% of the pupils were short-sighted.

In the year 1848 Szokalsky instituted inquiries in Paris and learned that in the College Charlemagne 1 in 9 was short-sighted, and in the College Louis le Grand, 1 in 7. This result was the more strange since among the 6,300 pupils in the Parisian elementary schools of the sixth and seventh districts, *not a single short-sighted child was found*. Szokalsky gives tables illustrating the gradual increase of myopia in the several classes. From the fourth to the first, the scale of short-sight rose in the College Charlemagne as 1: 21, 14, 11, 8, 9; in the College Louis le Grand as 1: 11, 12, 7, 4. In the latter case Szokalsky seems himself to have made the examination, still, this is not absolutely certain. Information concerning the degree of myopia is wanting.

In contrast with these older observations, which relate to complaints of children, or inquiries or very uncertain proofs, those published by E. von Jäger in Vienna in 1861, deserve prominence as pioneer works, for this investigator was the first to employ personal observation with the ophthalmoscope to determine the refraction of the children. He found in an orphan asylum among the boys who were 7 to 14 years old, 33% with normal sight, 55% short-sighted and 12% hyperopic (far-sighted). On the other hand, in a private school among pupils from 9 to 16 years of age, 18% normal, 80% short-sighted and 2% hyperopic. Jäger also noted the varying degree of short sight, although this was not arranged according to classes. His material also (100 cases) was, as he himself says, too small for general conclusions.

In the summer of 1865, Rüte himself examined from two Leipzig common schools in which 2,514 pupils were enrolled, 213 children sent to him by their teachers as suffering from affections of the eye. Of these 213, 107 suffered from inflam-

mation of the lids; conjunctiva and cornea, 107; 48 from short-sight. Therefore the number of short-sighted varied between 2% and 3%. Surely a large number of short-sighted pupils did not come within the knowledge of Rüte.

Since in the case of no one of the older inquiries was the number of children sufficient for the exclusion of accidental causes, nor in any case were the children examined by the physician himself; since, also, the degree of myopia in relation to the classes and the school sites and school seats were not taken into consideration, I undertook, in 1865-6, the examination of 10,060 school children, in such a way that first a preliminary examination of all the children was made in the class with letter-tests and then an individual examination with the ophthalmoscope of those who had not seen the letter-tests at the normal distance. Farther, I measured in each of the 166 classes the size of the children and all dimensions of the seats which I chanced to find. I also employed an illuminated chart. In the case of each pupil the age, school-year, reading-test, resulting spectacles and the result of the test with the ophthalmoscope were recorded.

In this manner I examined five village schools in Langenbie-lau, Kreiss Reichenbach in Schleswig; 20 town elementary schools; 2 intermediate schools; 2 higher girl's schools; 2 Realschulen, and 2 gymnasiums in Breslau, altogether 10,060 pupils, of whom 1,486 were village children and 8,574 city children. Of them I found 52% of the village children and 19.2% of the city *not* emmetropic¹ but ametropic². Altogether 17.1% of all pupils—almost a fifth part—were ametropic. This total would doubtless be considerably larger if I had not at that time excluded all cases of $M. < 1 D^3$ as not of sufficient consequence from my tables.

I found 83% of emmetropia, 13% of errors of refraction

¹Normal.

²Abnormal.

³Means myopia less than one dioptric. A dioptric is the unit of measure in cases of refraction, and is one meter in length.

(of this 10% myopia) and 4% of this eye-diseases. The frequency of myopia is shown in the following table:

I noticed in—

	PER CENT. M.
5 Village schools, - - -	1.4
20 Elementary schools, - - -	6.7
2 Higher girl's schools, - - -	7.7
2 Intermediate schools, - - -	10.3
2 Realschulen, - - -	19.7
2 Gymnasiums, - - -	26.2

Therefore among 10,060 children 1,004 M. =9.9%.

From this follows: 1. *That in the village schools only a few appeared short-sighted; that, on the contrary, in the city schools the number of the short-sighted continually increases from the lowest to the highest school; that, therefore, the number of the short-sighted stands in direct proportion to the longer strain to which the eyes have been subjected.*

In the city elementary schools from four to five times as many short-sighted children were found as in the village schools. In the village schools the number of the short sighted varies only in general between 0.8% and 3.2%; on the contrary, in the 20 elementary schools, the number was between 1.8% and 15.1%. In the different gymnasiums the difference amounted to only from 2 to 4%.

It appeared: 2. *That the number of the short-sighted from class to class in all schools increased.* On the average, the number of the short-sighted in all third, second and first classes of the village schools was 1.4, 1.5 and 2.6%; in the 20 elementary schools, however, it was 3.5, 9.8 and 9.8%.

In the Realschulen the number of the short-sighted from the sixth to the first grade was: 9, 16.7, 19.2, 25.1, 36.4, 44%; in the gymnasiums, 12.5, 18.2, 23.7, 31, 41.3, 55.8%. Therefore, *more than half of the members of the first grade were short-sighted.*

Naturally there were here and there slight discrepancies, as, for instance, in the first grades as compared with the second grades, but this usually resulted from the fact that generally

in the highest classes, since few children were included, a single case of short-sight gives an altogether different per cent. from similar conditions in the larger lower classes. With larger numbers, however, and on the average, I proved the progression constant.

In the village and elementary schools I found no essential difference between the two sexes; still, the large number of short-sighted which the gymnasiums and Realschulen show, proves that, amongst the 10,060 children, twice as many boys as girls were short-sighted.

Increase of myopia by school years was also shown in connection with the increase by classes. In the village schools I found among children who had passed the first half-year, none as yet, short-sighted. On the contrary, the fifth and sixth school year in the college schools showed 1.6%; in the city elementary schools 8.2%; in the intermediate schools 11.9%; in the Realschulen and gymnasiums 14.5% short-sighted. When I added the first four, and the last six school years (which contained the ages from about 7 to 20) I found 4.5, 9.6 and 28.6% short-sighted.

There was obviously shown in the 166 classes of the 33 schools, *an increase of the degree of myopia from class to class in all schools.* I chose at that time six indices of myopia.

1. M.1—1.5; 2. M,1.75—2.25; 3. M.2.5—3; 4. M.3.25—4; 5. M.5; 6. M.6. The 1,004 short-sighted children were divided under these six indices of myopia as follows: 466, 303, 150, 76, 6, 3. In no village school did I find a higher degree than M.2.25. On the whole, almost half of the short-sighted showed myopia less than 1.5. M.5 and M.6 occurred in gymnasiums and Realschulen. I found the higher degrees of myopia more frequently among the boys than among the girls.

Also with increasing age the degree of myopia increases, although the higher degrees of myopia occur more frequently in the first four school years than in the seventh to tenth year of age.

By adding together the degrees of myopia found in a class

and deducting the total by the number of short-sighted, I obtained the *average degree of myopia of the class*. The mean of these average degrees for the several classes for the school gave the *average degree of myopia of a school*, and the mean of these average degrees found in the several schools of the same class, gave the *average degree of myopia of a class of schools*.

Thus I found the average degree of myopia in five village schools 1.7; in 20 elementary schools 1.8; in two intermediate schools 1.8; in two Realschulen 1.9, and in two gymnasiums 2.0. The average degree of all short sighted pupils was M. 1.8. *Consequently, the average degree of short-sighted pupils is constantly increasing from the village schools to the gymnasiums.*

The following statistics show that it also increases from the lowest to the highest classes, from the sixth grade to the first.

In Realschulen: 1.8, 1.9, 1.9, 1.9, 1.9, 2.3.

In gymnasiums; 1.8, 1.9, 1.9, 2.1, 2.4, 2.4.

The average degree in the two sexes is not very different. Higher degrees than M.6, without complicating eye-diseases, were never observed by me.

The wish which I expressed in the publication of my discoveries in the year 1867, that elsewhere similar researches might be undertaken, has been generally fulfilled. There is a large mass of statistics gathered with much care by capable investigators in other cities, statistics which have the added excellence that in them the degree of M. < 1 D has also been taken into consideration. I had neglected these low degrees as practically unimportant; they are, however, important in the study of the development of myopia. Consequently, the discovered per centages of myopia are in the following tables generally much greater than mine.

Further, not both eyes together but each eye separately, has been examined by some of these physicians; other investigators have subjected all children, even the apparently normal, to the mirror test (by ophthalmoscope).

PERCENTAGE OF SHORT-SIGHTED PUPILS.

YEAR.	OBSERVER.	CITY.	INSTITUTION.	NO	PR. C'T M.
1875	Callan.	New York.	Negro Schools.....	457	3
			Primary Department.....	?	0
			Grammar Schools.....	?	5
1876	Loring and Derby.	New York.	Primary Schools.....	205	7
			District Schools.....	249	12
			Normal School.....	679	27
			Children of Germans.....		24
			Children of Americans.....		20
			Children of Irish.....		14
1877	Williams and Ayres.	Cincinnati.	District Schools.....	630	10
			Intermediate Schools.....	210	14
			High Schools.....	210	16
1877	Agnew.	New York.	New York College.....	579	39
			Brooklyn Polytechnic.....	300	19
			Academic Department.....	142	10
			Collegiate Department.....	158	28
1877	H. Derby.	Boston.	Amherst College.....	1880	28
			Howard College.....	122	29
1877	Bacon.	Hartford.	District Scholars.....	308	16
1877	Steven.	Hartford.	District Scholars.....	675	18
1881	Risley.	Philadelphia.	Primary Schools— Average age, 8½.....	{ 228	4
			Average age, 11½.....		9
			Grammar Schools, age 14.....		11
			Normal Schools, age 17½.....		19
1882	Mittendorf & Derby.	New York.	Primary Schools.....	203	3
			Grammar Schools.....	698	8
			Grammar Schools.....	896	13
			College Students.....	204	35
1883	H. Derby.	Massachusetts.	Amburst College.....	254	47
1884	Gardner	Springfield	Several Schools.....	1082	9
1885	Randall.	Philadelphia.	Students of Medicine.....	90	10
1887	Tilany.	Kansas City.	Different Schools.....	2040	5

It would take us too far to describe here the particulars of all of these statistics, which concern almost 200,000 school children. They collectively establish the general results of my researches, and also in method of investigation differ very little from mine. Besides, many of the statistics have only a local interest. However, in order to give a picture of the enormous industry of the investigators in this sphere, and since, also, such a collection might be important in ethnographical research for further investigations and for the comparison in later decades, I have given the preceding tables concerning 200,000 pupils; of these investigations I will make further mention only where new points of view have been discovered. Only American statistics are copied.

Among the labors which offer new bases of observation those of Erismann (1871) are next to be named. He examined in St. Petersburg 4,368 pupils with Snellen's tests at six metres distance, and found 30.2% short-sighted, 26% normal, 43.3% far-sighted and 5% weak-sighted. He correctly conjectures that hyperopia is the normal condition of refraction in the youthful eye and that only the smaller portion of the cases remain far-sighted. The majority become short-sighted after they have passed through the state of normal sight.

As evidence, the following statistics of classes were of service to him:

CLASS	I.	II.	III.	IV.	V.	VI.	XII.	IX.	X
Myopia.....	13.6	15.8	22.1	30.7	38.1	41.3	42	42.8	41.7
Hyperopia....	67.8	55.6	50.5	41.3	34.7	34.5	32.1	36.2	40
Emmetrope..	18.6	28	26.1	27.3	26.1	24.2	25	24	18.3

Later I was able in the case where atropine was used in the examination of the entire village school, to furnish proof that Erismann's conjecture was correct.

Erismann's tables agree very well with mine. He frequently observed spasm of accommodation when the acuity of vis-

ion was not complete, and severe reddening of the optic nerve was present. Only in 85% did he find $S=1$, or >1 ; in in 6.8% $S<1$ and $>^2_3$, and in 7.6% $S=<^2_3$. Erismann found that acuity of vision diminished in the higher degrees of myopia. He observed, however, that the stronger concave glasses, on account of their diminution of the size of the object, must reduce keenness of vision. Among 1,245 short-sighted pupils, Erismann observed only in 5% no atrophic choroidal variations. On the contrary, in 71% a moderate, and in 24% a high degree of choroidal changes. In the higher classes these changes were more frequent. According to the school years they increased from 14% to 58%. In degrees of myopia more severe than $M=3.0$, he always found staphyloma posticum; in $M.>6.0$ even 70% of serious variations. Erismann observed insufficiencia recti interni in 32% of all short-sighted pupils. Serious insufficiency and comparative outward squint was more frequent in the higher schools and older classes than in the lower schools and classes. Already, in the weakest degrees of myopia 23% of disturbances of muscular equilibrium occurred; the percentage increased with the degree of myopia.

In order to put an end to all objections against the demonstrability of the first statistical conclusions obtained concerning the increase of myopia among school children, it appeared to me a very important duty *to examine for refraction the same pupils* of an institution after the course of a few semesters. Accordingly, in May, 1870, I examined the pupils of the Breslau Frederick gymnasium, and repeated the examination in November, 1871. At the first examination there were found among the 361 children, 174 abnormal, viz: 35% myopic; 7% hyperopic, and 6% with eye diseases. From the seventh grade to the first grade, I found the following increases in the number of the short-sighted: 13, 21, 27, 35, 48, 58, 60%. They showed 12% myopia 0.75 to 1; 47% myopia 1—2.5; 25% myopia 2.5 to 5, and 6% $M>5$. After one and one-half years 103 normal-sighted pupils and 71 myopic had left the school, only 84 formerly observed as normal and and 54 ob-

served as short sighted—together 138—could again be examined. Of the 84 formerly observed as normal only 70 had remained normal; that is, 14 or 16% had become short-sighted. The degree of myopia existing meanwhile varied from 0.75 to 2D. Of the 54 previously short-sighted, 28 had suffered a decided increase in degree in the one and one-half years. I found in no case a decrease.

Both the lowest and the highest degree of short-sight, added their contribution to progressive myopia, as follows:

MYOPIA.					INCREASED IN—PER CENT.	
0.75—1	-	-	-	-	30	
1—1.25	-	-	-	-	38	
1.25—2.5	-	-	-	-	69	
2.5—3.25	-	-	-	-	100	
3.25—5	-	-	-	-	43	
5—10	-	-	-	-	66	

Among 54 examinations, in 28 *i. e.* 52%, myopia was progressive.

The average of the short-sight of all 28 progressively short-sight pupils was, the one and one-half years previously, $M=2$, now $M=2.75$; in this short time the average therefore increased $M=0.75$.

Concerning the acuity of vision it is important to note that all pupils formerly found normal and now found short-sighted had preserved complete sharpness of vision. Only in two cases of stationary myopia (among 20) had the sharpness of vision sank from 2_3 to 2_4 . Among the 28 progressively short-sighted pupils, one and one half years before $S=1$; in the case of four it had now decreased to 1_2 and 1_4 . Five of the progressively near-sighted had before sharpness of vision 2_3 . In no case had decrease of sharpness of vision supervened. I found staphyloma in the case of 14 who had, from normal sight, become short-sighted; 20 stationary short-sighted pupils had formerly 7 now 14 staphyloma. In 12 cases of stationary myopia no staphyloma occurred. Among the 28 progressively

short-sighted formerly 15 now 22 had staphylomata. There had occurred, therefore, within three semesters, 10% of changes in the posterior portion of the eye.

These results were confirmed by von Reuss, who repeated his investigations in the Leopoldstadt Gymnasium in Vienna, in the years 1874, 1875 and 1876. He had examined with the mirror all short-sighted pupils, and all whose $S < 1$; also he had tested each normal-sighted pupil by means of convex glasses for possible far-sight, and had examined each eye separately. In May, 1872, he found among 409 pupils, 35% normal, 41.8% myopic and 20.5% hyperopic; 2% astigmatic and 7% with eye-diseases. The number of the short-sighted increased from class to class: 28, 41, 49, 48%. Far-sight decreased from class to class: 30, 27, 14, 12%. He found the low degree $H < 1$ in 85%. Among 162 examined with the mirror, von Reuss observed in 41 (25%) decrease of accommodation, namely: 16 in the case of $M < 1$; 12 in $M 1-1.75$; 13 in $M 1.75-2.5$; 11 in $M 2.5-3$; 13 in $M 3-6$. No increase of this disease showed itself in higher classes. 102 pupils had different degrees of myopia in the two eyes; 54 had one eye normal; 38 had myopia and 16 had hyperopia in the other eye; 7 had a myopic and a hyperopic eye.

One year later the examination was repeated. Only 20 of the children being present. Unfortunately the mirror was not employed. Refraction was found the same in 42%; progressive in 46%; regressive in 12%. In the lower classes more stationary cases were found than in the higher. 71% remained normal; 19% had become short-sighted; 10% had become far-sighted. Of the myopia 28% were stationary; 61% progressive; 11% regressive; showing spasm of the ciliary. Examination with the mirror and atropinization backing these figures, are to be accepted with caution.

Finally, von Reuss' third examination took place in 1875, in the class of 201 pupils.

TOTAL	PR. CT. AFTER 1 YR.	PR. CT. AFTER 2 YRS.	PR. CT. AFTER 3 YRS.
Stationary,	42	37	28
Progressive,	47	50	61
Regressive,	10	11	10

	ALSO STATIONARY.	PROGRESSIVE.	REGRESSIVE.
From 1872-'75 Emmetropic,	56	37	10
Myopic,	15	77	8
Hyperopic,	12	72	16

For particulars concerning increase of each degree of each affection, see the original essay. Only 12% of the short-sight remained *unchanged* after three years. Spasm of accommodation was observed but regression was never found in the case of $M > 3$. By comparison of results obtained through sight-tests and the mirror, von Reuss found, 1. *Apparently*, progression is brought about by spasm of the ciliary in a not very large number of eyes. Spasm of the ciliary can exist several years without affecting the structure of the eye. Spasm of the ciliary changes the real refractive condition in the direction of progression; this is the most frequent result. 3. Progressive changes come without accompanying disease of accommodation; this result is by no means rare. Therefore, the origin of myopia or its increase, does *not always* depend upon spasm of the ciliary muscle. On the contrary, Burchardt, in Berlin, was led by determinations of the near-point to the conclusion that disease of accommodation has *always* been present a long time, and is, almost without exception, the cause of definite short-sight.

Worthy of recognition as the careful mirror-examination by most late investigators of the refractive condition of all pupils is, it is still by no means infallible. I have often enough observed that accommodation is *not* relieved of strain with plane mirror and in large rooms—indeed, that it is in some cases strained even there; this is also admitted by von Reuss and Stellwag. Further, not a few cases are known to me in which experienced colleagues, who are very proud of their determinations of refraction with the erect image, have erred by 1—2 D, especially in the case of weak myopic and hyperopic subjects. The total measure of the accommodation muscle is, indeed, not always quite certain. Therefore, statistics founded upon observations of this kind, are not ab-

solutely certain; to this end all children and, if possible, the observer himself must be atropinized. *Homotropine* in weak solutions acts upon the accommodation too ineffectually to make us lay any real weight upon measurements by this means. Dürr, in 1883, examined with *homotropine*, the pupils of a lyceum, but only 318 of 538 underwent the administration of the mydriatic. Naturally, Dürr found diseases of accommodation frequent in all conditions of refraction. For questions of hygienic statistics reading-tests and spectacle-tests will, in the case of school children retain their great value.

Also, Conrad very carefully examined the school children in a body with the ophthalmoscope and with spectacles, and is of the opinion that with the mirror one is never sure that accommodation is fully relaxed. He, however, considers that differences when atropinization was used are "extremely small." He found among 3,036 eyes, by reading tests: hyperopia 11%; emmetropia 55%; myopia 32%; by mirror, hyperopia 47%; emmetropia 29%; myopia 22%. For the rest he agrees with Erismann, that hyperopia slowly passes through normal sight into short-sight. With the mirror he found in the lowest classes 70% hyperopia; in the highest only 22%, emmetropia in the lowest classes 25%, in the highest and in the middle classes 30 to 35%; also, myopia rose from 4 to 51% by mirror-test, from 11 to 62% by the reading test, so that there was about 10% of spasm of accommodation present.

Repeated tests of the same pupils are found in the late work of Ott, in Lucerne; of Netoliczka, in Graz; of Florschütz, in Coburg; of Erismann, in St. Petersburg; of Reich, in Tiflis; of Derby, in New York; of Albrecht, in Strassburg; of Adamük, in Kasan, 1877 to 1886; of Haab, in Zürich, 1882 to 1888; in the Russian cadet-corps, 1882 to 1887; of von Hippel, in Giessen, 1881 to 1889, and of Schmidt-Rimpler, 1885 to 1889.

The communications of Florschütz show results of the highest interest, since they show the decrease of the number of short-sighted pupils in the newly constructed "school palaces."

Thus, the common schools showed still in 1874 12 and 14, in the year 1877 only 4 and 7% myopic; 2323 pupils examined in 1874 showed 21%; in 1877 only 15% myopic. Erismann found in 1876, in the case of 350 eyes which he had examined in 1870, 67% increase of short-sight, of which 16% was change from emmetropia to myopia, and 25% increase of myopia. Reich saw in six years 14% change from hyperopia to myopia; 44% from emmetropia to myopia, and 81% increase in myopia.

H. Derby examined 254 students of Amherst College (19 to 23 years of age) again four years after entrance into the institution, and found instead of 15% hyperopic, 49% emmetropic and 35% myopic, which had been recorded on entrance; 18% hyperopic. 34% emmetropic and 47% myopic.

Of the 125 normal-sighted 23% had become myopic; the degree was on the average 1D. This fact is of the greatest importance, because widespread opinion since the time of Donders, holds that after the age of 15 myopia does not often develop in eyes hitherto sound, and that after the age of 20, it never develops in sound eyes. From my own practice I can produce many observations similar to those of Derby.

Derby shows that of 90 short-sighted students, 32 kept their degree of myopia; 28 suffered an increase of 1—2.5 D during their four years course. The average degree at entrance was 1.8 D; at graduation 2.4 D; an average increase, therefore, of 0.6 D.

Ulrich had charge of 273 eyes which Hoffmann had examined three years before. He showed in 41% increase in refraction, M1 to >2D. Adamük maintained in 1886 that previous observers had not made repeated examinations of the eyes of the same pupils. From the foregoing it is seen that he was not acquainted with the literature of the subject. He himself examined two gymnasiums yearly for nine years. At first, of 317 pupils 14% were myopic, who in 91% showed increase of short-sight; also 52% hyperopic and 32% emmetropic suffered a change in their refraction.

Haab in Zürich continued yearly till 1888 the examinations begun by Horner in 1882.

Of the 309 pupils then examined, 208 were still in the school after 6 years; at first 16% were ametropic and 3% myopic; after 6 years 25% were ametropic and 11% myopic. The short-sighted had increased fourfold.

The examinations conducted from 1882 to 1887 in the Russian cadet corps, on an average 1896 pupils yearly showed in these 6 years: 24, 24, 24, 30, 23, 23% myopia, an average of 25%. In these observations, however, the lowest degrees were considered, 32% $< 1D$; deducting these, only 17% myopic remain, which come near my results in the *Realschulen*. While the gymnasiums show more short-sighted pupils, still, 39% of the myopic pupils in the corps had become short-sighted therein. In the fourth and fifth years of residencee 25%; in the third 18; in the sixth 17; in the second 13; in the first 8, and in the seventh 6% of the cadets; most, therefore, in the third to the fifth year.

The observation is also interesting that among the officers found myopic in the military schools, only 35% were prepared in the cadet-corps, while 65% were prepared in other institutions.

Schmidt-Rimpler found among 178 pupils of the Rheinisch gymnasium, after three and one-half years, 18% myopic, who had formerly been emmetropic, and 52% increase of myopia.

Finally, the repeated examinations by von Hippel of 833 eyes in the Giessen gymnasiums must be noticed. 508 were originally emmetropic and hypermetropic; 75 of them—that is 12%—became myopic; among 186 myopic pupils, in 107 cases, 58% increase of myopia was observed.

Of universal interest ought the fact to be that the only examination which has hitherto been made in a kindergarten, and made very carefully, indeed by Koppe in Dorpat, showed *not a single case of myopia*; but on the contrary, 98 per cent. hyperopic and 2 per cent. emmetropic.

MYOPIA AMONG STUDENTS.

In Tübingen Gärtner observed among 138 students of the Evangelical Theological School, from 1861 to 1865; 81 per cent. myopic, and from 1861 to 1879, in the case of a second assemblage of Evangelical Theological candidates 79 per cent. From 1861 to 1882, among 713, he found 78 per cent. myopic.

Donders had already spoken these impressive words: "It would be of the greatest importance to possess accurate statistical data concerning ametropia obtaining among a certain class of men—for instance, the body of students of a university—in order to be able to compare them with results of repeated examinations at a later time:" If in this way it should be found—and I hardly doubt that this, in fact, would be the result—that myopia is progressive in the established orders of society, this would be a symptom worthy of consideration, and means would have to be thought of to stop this progress.

I sought such statistics in 1867, but it was difficult to collect the Breslau students for an examination. Of the 964 students only 410 appeared. Among these 60 per cent. were myopic, namely: Catholic theological students, 53; law students, 55; medical students, 56; Evangelical theological students, 67, and philosophical students, 68 per cent.

In 1880 I examined 108 students of medicine, and found 57 per cent. myopic; before the examination for their degree, 52 per cent.; after this examination, 64 per cent. I long ago entered in my case-book "Examination Myopia," because I observed the beginning and increase of myopia after all hard State examinations, both final examinations in the gymnasiums and seminary examinations, in the case of medical, legal, philological and theological examinations.

Derby's results in Amherst College have been given. Segel remarked among 284 going from the gymnasium as volunteer soldiers and as candidates for officers' positions, 58 per cent. myopic. Collard examined the students in Utrecht in the winter of 1880. 410 of the 550 students presented them-

selves. Among the 820 eyes of these students 27 per cent. were myopic, thus: among theological, 23; medical, 26; law, 29; natural history, 32; pharmaceutical, 31; philosophical, 42 per cent.

Collard did not find more short sighted students among the older pupils (in years, than among the younger; on the contrary, he found a decrease in number, thus: from 18 to 20 years of age, 30 per cent.; from 21 to 23 years of age, 28 per cent.; from 24 to 27 years of age, 27 per cent. myopic. The oldest pupils are not by any means the most diligent. Donders accompanies the statistics of Collard with remarks. He states that myopia is less frequent in Holland than elsewhere, and that higher degrees of the disease are seldom found. Examination of students and young peasants would be more conclusive than that of school children. Only by repeated examination of these should I decide whether myopia is prevalent or not. Among 354 students in Copenhagen, who belonged to the military schools, Tscherning found 38 per cent. myopic. Among 330 students in Grönningen, Kremer found 32 per cent. myopic; of medical students, only 25 per cent.; of theological students, 57 per cent. Davidson reports from Aberdeen that at the University there at the utmost 12 to 16 per cent. of myopia occur.

Randall found among 92 students in Philadelphia, 10 per cent. myopic. According to the ophthalmoscope only 19 eyes among 142 were myopic, while there was manifest myopia in 54. The fundus oculorum of the short-sighted was in every case abnormal. "The intraocular disturbances," says Randall, "come from straining work, and produce the typical student's eye-ground, to which certain German professors ought to direct the attention of their pupils.

Cranicean tested in five semesters 1885 to 1888, the 229 medical students in Budaspeth, who came to the course on the ophthalmoscope, and found 30 per cent. myopic. Myopic eyes were shown as follows: Up to 1.5 D: 56 per cent.; to 3 D: 27; to 6 D: 46, and to >6D: 10 per cent. Manolescu found in the Bukarest University 33 per cent. myopic.

MYOPIA AMONG SCHOOL CHILDREN IN DIFFERENT NATIONS.

It has frequently been asserted that the *German* schools are really the hot-beds of myopia. At any rate the researches of Hoffman, Ulrich and Stilling, reveal that among native old Alsations certainly less myopia occurs than among immigrant Germans. Thus, Stilling found in the *Real gymnasium* of St. John, in Strassburg, of which three-fifths were Alsations, among 422 pupils, only 49 myopic=11 per cent; on the contrary, in the *Lyceum*, which contained only one-third Alsations, he found 31 per cent. myopic. Of 100 German pupils in the Strassburg schools, 34 per cent. were found short sighted; of 322 Alsations, only 5 per cent. were myopic. Stilling attributes the great difference to differences in the structure of the orbit.

Pflüger found by examination of 529 Swiss teachers, aged from 20 to 25 years, that the *German* show more short sight than the French. 154 French Swiss had 14.3 per cent.; 357 German Swiss, 24.3 per cent myopic.

	WELSH SWISS, PER CENT.	GERMAN SWISS, PER CENT.	TOGETHER, PER CENT.
M<2.25	4.5	12.0	10.5
M>2.25 and <3.25	50.0	40.	44.0
M>3.25 and <5	27.5	35.5	32.0
M>5 and <6	0.0	10.0	10.0
M>6	0.0	4.5	3.5

Emmert made tests in four Swiss Watchmakers' schools and observed 71 per cent. hypermetropic; 15 per cent. emmetropic and 14 per cent. myopic. Especially frequent there was insufficiency of the internal recti, 54 per cent.; also in the schools of those places in which watchmaking was pursued, 22 per cent. of insufficiency was found, as against 4 per cent. in other towns. Emmert believes that watchmaking, on account of the use of one eye with the magnifying glass, very easily gives occasion for disturbances of the muscles, and that the tendency to this is very easily inherited.

According to Maklakoff, the percentage of myopia among the Georgians and Armenians in the Caucasus, must be very small. Reich asserts the exact opposite, who also considers as very questionable the opinion of Dor: "The farther south you go the more normal eyes you find," and he suggests that Mannhardt especially comments on the national tendency of the Italians towards myopia. In four towns of Tiflis, examined by him, *Reich* found among the Georgians and Armenians more short sighted than among the Russians. For example, in the gymnasium, 38 per cent. of Armenians; 45 per cent. of Georgians, and 30 per cent. of Russians; also, he observed among the former a higher degree of myopia and a more rapid increase of percentage of myopia with the classes. He was struck with the large, almost prominent eyes of the Armenians and Georgians. The Armenians, also, had more myopia among them than the Grutinians. In the lowest classes of the gymnasium in Tiflis, Reich found only 12; in the highest, 71 per cent. myopic. Moreover, $S = \frac{9}{6}$ in 52 per cent. of the pupils. The wide occurrence of myopia in Russian educational institutions has been shown by Erismann and other observers. The Ural gymnasium, examined by Dobrowolsky, forms an exception. This contains mostly Cosack children, and showed only 12 per cent myopic. Not 77 per cent. myopic are reported in the gymnasium of Irkutsk.

Up to this time only a few researches have been made in England.

Priestly Smith found in 1880, among 1,636 school children, 5 per cent. short-sighted, and among 537 seminary students, 20 per cent. myopic. In 1883 Hadlow found, in the schools at Greenwich Hospital, which are reserved for preparation for naval service, among 1,074 pupils who, at their entrance into the institution at the age of 13, had possessed normal sight, after two and one-half years, at the end of their course, 60 pupils affected with myopia, complicated with such disturbances of vision that they had to be rejected as unserviceable in naval employment. Therefore, in two and one-half years

5½ per cent. had become so short-sighted that their special preparation for naval service had become useless. Ellis observed in 1885, in the primary schools at Oxford and Hamilton, 24 *i. e.*, 11 per cent. myopic. Frost, in London, observed 11 per cent. short-sighted.

In France, in 1874, investigations were instituted by *Gayat* in Lyons, and included children picked out "on hand or seen au demande du Maître, in this fashion: a pres de 600" were examined. The number of short-sighted pupils being thus determined, it is not fair to accept this 3 per cent. myopic as representing the per centage of the total number of pupils. Dor, at first, referring to *Gayat's* statistics, concluded that there was far less myopia in France than in Germany. Later, he himself in Lyons, in a lyceum, examined the pupils, and found them 23.4 per cent. myopic (the same as in German gymnasiums).

Nicati in Marseilles, examined 3,434 pupils with glasses and the mirror, and found in the Jewish primary schools, 15 and 10 per cent. myopic, as against 8 and 7 per cent. in the Christian primary schools. *Nicati* offers this as the best evidence for inheritance, since the Jewish pupils are children and descendants of store-keepers, and the Christian children are descendants of hand-workers, craftsmen and peasants, and in their families from the first generation enjoying school-training. *Weiss*, in his investigations in Mannheim, was unable to find this excess of myopia among the Jews. Myopia was very frequent among Jews and Christians; still, *Weiss* found in the gymnasium of that city less myopia (30 per cent.) than in Heidelberg (35 per cent.); he thinks the inheritance of myopia less in the trade and manufacturing towns of Mannheim than in Heidelberg, inherited by the rich class of learned and office-holding people. Also, *Kuchner* in 1889, was unable to find any important differences between Jewish and Christian pupils in the Berlin gymnasiums. Of 307 Jews, 16 per cent.; of 1,023 Teutons, 35 per cent. were myopic; but *Kirchner* observed $M > 8D$ more frequent among young Jews than among Teutons. $M > 4D$ more frequent among Jews than among

those who were not Jews. He thinks that the reason for this must be sought in the earlier bodily and spiritual development of the Orientals.

In Italy, at the instance of Simi, in 1884, by Del Carlo, in Lucca, by Scellingo, in Rome, by Masini in Siena, by Magne, in Naples, by Brignoni, in Trapani, and by Saltini, in Parma, investigations were undertaken which show a very close correspondence in results with those obtained in German institutions.

so results obtained in Sweden and Hungary resemble those obtained in Germany.

Roumania, Manolescu observed in Roumania elementary schools, among lower and higher gymnasium pupils, 2, 4 and 10 per cent. myopia; on the contrary, among pupils not Roumanians he found 15, 11 and 21 per cent. short-sighted.

In America, Callan examined 457 negro children. They were from 5 to 19 years of age, and attended two New York schools. Only 2.6 per cent. were myopic; in the higher school 1.2 per cent.; in the lower 1.2 per cent. The short-sighted children, as a rule, over ten years old. The higher degrees of myopia occurred among pupils over 14 years of age. In the primary departments of both schools there were no short-sighted children; in the higher classes of the primary departments, 8.2 per cent, and in the lower schools, 1.6 per cent. With glass

Callan found only 67 per cent. of hypermetropia. After he had atropinized himself (truly as valuable for the examination as uncomfortable for the examiners) he found, by the same method, 90 per cent. hypermetropia. In the Indian schools at San Carlos, Fox observes only 2 per cent. of myopic pupils. In a similar manner Loring and Derby made researches in New York among 2,265 eyes of school children, and found the same incidence of myopia as has been found in Germany, according to Loring. It is interesting to note that among children of German parents they observed 24 per cent.; among children of American parents only 20 per cent., and among Irish children, 15 per cent. myopia. On the whole the number of short-sighted children was less than in Germany; in the primary

schools 7; in the district schools 12, and in the normal schools 27 per cent. myopic. An examination with glasses and mirror which Agnew had made, through a number of physicians, of 1,479 pupils in different higher and lower schools in New York, Cincinnati and Brooklyn, showed in Cincinnati in the common schools 10; in the intermediate schools 14, and in the normal 16 per cent. The result in New York was: In the lowest class, 29 per cent.; in the freshman class 40; in the sophomore class 35; in the junior 53, and in the senior 37 per cent. of myopia. In Brooklyn there were found: In the academic department, 10 per cent., and in the collegiate department 28 per cent. myopia.

Haskert Derby found in Amherst college, 28 per cent.; in Harvard college 29 per cent. myopic. After a year, half of the short-sighted had reached a higher degree of myopia. After 4 years he repeated the examination and found that 10 per cent. of emmetropia had changed into myopia, and that myopia had increased 21 per cent. In 1875 he found: Emmetropia, 51 per cent.; hypermetropia, 5 per cent.; myopia, 45 per cent. In 1879 he observed: Emmetropia, 36 per cent.; hypermetropia, 13 per cent., and myopia 51 per cent.

It is thus seen that American pupils approach very near to the German in myopia; at any rate Randall found in Philadelphia, among 92 medical students, conspicuously, only 10 per cent., while Risley, in the normal school of Philadelphia, over 19 per cent. myopia.

In Buenos Ayres, among 6,163 children, only 4 per cent. were found myopic by Roberts.

Collard, among 790 eyes of Dutch students, observed only 27 per cent. myopia; but among 30 eyes of German students at Utrecht, he found 40 per cent. myopic.

From Oriental schools we have few reports. In a Greek school in Smyrna, Issegonis found 46 per cent. myopic in higher classes.

Upon a visit to Constantinople in 1877, I had access to three Turkish schools, a high school, a military school and a people's school, in which no teacher or pupil wore glasses. In the

military school, General von der Goltz-Pasha examined 379 pupils with my table, and found 17 per cent. *ametropic*, exactly as great a proportion as was found, on the average, among the 10,060 school children of Breslau, in 1865. Among 67 Jemenlis (South Arabians) and Tripolitans, who are recognized as short-sighted, there were 40 per cent. *ametropic*. We do not know how many of them were short-sighted, since no tests with glasses were made.

From all the figures given above it only follows with certainty *that in the whole civilized world, in all nations, the number of the short-sighted increases with the demands which their school work makes, and from class to class.*

THE MYOPIA OF SCHOOL CHILDREN NOT AN UNIMPORTANT DISEASE.

The continued confirmation of the wide occurrence of myopia among school children and the increase of short-sight from class to class have, since, 1865, engaged the attention of all physicians, teachers and officers, and a series of hygienic suggestions for the prevention of school-myopia has been called forth. For several years, however, the voices of well-known physicians have been loud in proclaiming that too much is being made of myopia; that it is not a disease at all.

The first who, in a mild fashion, took opposing ground was Donders himself, whose opinions set forth in 1881, very considerably retreat from his outspoken position in 1864. The same Donders had said: "I say without hesitation that a short-sighted eye is a diseased eye," and we had considered each case of progressive myopia as a case of *actual disease*. The same Donders, who remarks on the preface to the German edition of his works (1866): "For a series of years I have made incisive examinations of the anomalies of refraction and accommodation of the eye, and have determined and tested all the circumstances relative thereto in the case of thousands of eyes;" the same Donders who says at the close of this preface: "Practice joined with learning has here reached the

unusual and glorious consummation of being able to give some prescriptions grounded on ascertained principles, and of being led by a clear insight into the nature of its treatment;" the same Donders declared in 1881, that the injurious consequences of myopia had been much exaggerated. "If the highest degrees are worthy of attention, still they are usually to be corrected by timely use of suitable glasses, and the lesser degrees bring with them a capacity for fine hand-work, and learned investigations, which we could not willingly miss.

"In truth," says Donders," with the same emphasis with which he asserted the contrary seventeen years earlier, "if it lay in my power to exclude all short-sight from the world, I should not want to do so. In myopia we see an example of this in certain directions desirable adaptation of an organ to the influence of its use. In use lies immediately a correction for far-sight, which occasions only discomfort and not pleasure. The question is whether in contending with myopia we cannot over-shoot the mark. It would not be at all unsuspected by me, if in the end, the learned and the peasant class have each the most efficient eye for its purposes."

Hitherto no testimony has been adduced that increase of myopia can be stopped by timely provided glasses. I can produce from my case-books many cases to the contrary, in which near work, in spite of glasses early provided, occasioned increase of myopia.

Furthermore, the advantage which several thousands of men who pursue "learned occupations, and (to my mind very superfluous) fine trades," derive therefrom, that they need no convex glasses in old age for close work, entirely disappears when weighed against the suffering which millions of short-sighted men suffer if they have not their distance-glasses, and when weighed against the dangers of progressive short sight. Donders here forgets that in the case of increasing myopia sharpness of vision is lost and that, therefore, no distance glass restores for distant vision normal sight to the highest degrees of myopia. The man possessing normalsight who wishes to pursue "learned occupations and fine trades," can see these

fine manufactures with ease by means of convex glasses, and still preserve his good vision for distance. For the sake of the comfort of a few thousands of workers in delicate manufactures, and of natural philosophers, to wish that short-sight may not be excluded from the world, is a thought not to be seriously considered.

Also, the view of Donders that myopia is a wholesome correction for hypermetropia, *which occasions only pain and no pleasure*, is only a sounding phrase. It is not a question of pain, but of danger. Hypermetropia brings no danger, myopia occasions it often. The far-sighted man becomes normal through a convex glass, and his eye in the interior suffers no injury; the short-sighted man, in spite of a glass, suffers internal changes of the eye. It is necessary, therefore, to test these remarks of the changing Donders on the subject as of slight value.

On the other side, Donders set forth anew in 1881, that "myopia of a high degree is not only an inconvenience but also a danger to the eye," and that, if it is true that myopia is spreading, we have every reason to check it. In Holland myopia is of less frequent occurrence than elsewhere and, of higher degree is seldom encountered there. For this reason few statistical examinations have been made there. Little good is to be expected from further tests of school children. It is of more importance to examine young people of different classes during the period in which the degree of myopia becomes stationary for life; that is to say, students on the one hand, and on the other young people from the peasant class. If, after a period of years, such examination was repeated, it would be possible to decide whether myopia is spreading.

Also *Otto Becker*, in 1883, held that the view that myopia is increasing now as compared with the past, has not been established. Twenty years ago myopia was not distinguished from hypermetropia. It will be necessary, particularly to gather perfectly accurate results among those bound to military service, and repeat them for 25 years, in order to find out whether an increase is taking place.

Donder's wish was answered by Tscherning in Copenhagen; in the year 1883 his work appeared, which treats of observations upon 7,564 persons from 18 to 25 years of age (not only school children, but also men in military service of all ranks). He examined only with the eye-mirror, and did not in the first year take into consideration his own M of 0.5D. Besides, he introduced an entirely arbitrary classification, in which he reckoned every $M < 2D$ and every $H < 2D$ as emmetropic, which is entirely false. He who needs correction for —or $+1.5$ is just as abnormal as he who needs —or $+2D$.

Although, therefore, he reckoned many as normal-sighted who were not so, yet he comes to the conclusion that the influence of close work is plain. Among students he found 32 per cent.; among clerks, 16 per cent., among hand-workers, who do only average work, only 5 per cent., and among country folks, only 2 per cent. myopic. He holds close work to be a cause of myopia, but considers this, when it remains within narrow bounds (3D), as unimportant. The higher degrees were rare in the schools. The last conclusion is nothing new. I, also, 26 years ago, found among 10,000 children, 919 with M_1-3 ; 76 with $M_{3.5}$, and only 9 with M_5-6 , *but not a single case of myopia greater than 6*.

When Tscherning now finds the highest degrees M_9-12 more frequent among country people, and considers that these higher degrees are congenital and follow altogether different laws; this also is nothing new. Already in the beginning of this century cases of severely myopic country people were discovered; but this does not at all invalidate the laws concerning the increase in the number and severity of cases of myopia in schools. Tscherning observed the people only at the age of 20 to 22; what the condition will be in their fortieth year he naturally cannot know. When he states that the dangerous diseases accompanying myopia concern only $M > 9D$, he errs. I have observed detachment or defects of the retina in the case of M_5 or 6, and every oculist knows that disturbance of vitreous humor, injurious muscle insufficiency, and inflammation of choroid occur frequently in the lower degrees.

M6 is in itself a very uncomfortable condition for life. Moreover, I found among 7,523 persons whom Tscherning examined, only 2.9 per cent. $M > 6$, in whose case close work was the occupation, and only 1.6 per cent. $M > 6$ who did no close work. Therefore, then, it has been shown why we should decide that though admixture of school-myopia with pernicious myopia, the former has been really over-estimated.

Tscherning conceives school-myopia as *an anomaly caused by work, produced through adaptation of the eye to work*; not, however, as a real disease. Where has he given proof that out of the so-called weak work-myopia the higher degrees do not afterwards develop? When Tscherning considers myopia up to 9D as unimportant for the future, because among his patients he has seen no case of complete or partial blindness, we can only wish for him, as Donders did for E. von Jäger, in 1866, a long life and a wider sphere of work, that he may be able to examine his 20 years old myopic subjects in the fortieth and fiftieth year of their life. Just then, as Horner has shown the bad forms of short-sight, in the case of previously light degrees, develop themselves. The setting of the limit at 9D is entirely arbitrary with Tscherning. M6 is considered by the military authorities as the least for admittance.

Vessely, in Vienna, in like manner as Tscherning, found among 1,405 military servants at the age of 20 to 24 years, that 35 per cent. had $M < 3$; 39 per cent. had M_3-6 , and 26 per cent. had M7. The educated divided themselves into three groupes, 21 per cent., 24 per cent., and 10 per cent.; the uneducated into 13 per cent., 15 per cent., and 17 per cent. Therefore, myopia was far more wide-spread among the educated, but only in moderate degree; the high grades were more numerous among the uneducated.

Also, Stilling considers myopia of moderate degree as unimportant; but he is too keen a student of Darwin to dispose of this myopia in Tscherning's manner. Indeed, he holds the view that myopia as a phenomenon of adaptation, is a misunderstanding of Darwin's teaching. Too short a time since the diffusion of close-work has elapsed for an adaptation in

Darwin's sense. He thinks it must be compared with analogous incidents, such as the so-called "ride-leg," or the "hands of the piano-player." One may dispute with Stilling whether the moderate degrees of short-sight are an evil, or, if they are, whether "this work-myopia, compared with the great number of greater ills, is small and very tolerable, and not at all of a nature to rouse serious fears? Truly, we answer, cancer, diphtheria and cholera are far more dangerous than myopia; but, is loss of distance sight a matter of indifference because there are worse ills? Every normal-sighted person who, for one day should wear constantly glasses +3D, and thus artificially make himself so short-sighted that he could see clearly only one-third of a metre, would be of a very different opinion. I will not comment upon the bad state of the short-sighted *soldier, rider, hunter, sailor, etc.*, whose glasses have been lost, broken, bent or only tarnished. Concerning the diseases of sharpness of vision, even in the case of slightly myopic persons, something more searching will be said below.

Also, von Hippel attached himself to Tscherning. When he found in a gymnasium of good hygienic condition in Giesesen, 34 per cent. of myopia, he wrote the monstrous sentence: "Education and knowledge are not by any care now to be acquired without a certain injury to the body." In 1889, in spite of my rebuke of this sentence, he held it to be "fully and entirely correct," and added that, in spite of the knowledge that reading and writing among youths has a disadvantageous effect upon their eyes, we are compelled to keep them at their studies. I argued to the contrary:

1. If, in truth, education and knowledge are not to be acquired without a certain injury to the body, then must *all* school children, who collectively are busied with reading and writing, become short-sighted, while myopia attacks only, on an average, 20 per cent. of all pupils.

If von Hippel's assertions were correct, we ought also to be able to apply it to other bodily functions of the children. How is it in this regard with the influence of education and knowl-

edge in music? Has anyone yet heard that the hearing of a child had suffered through musical practice? Surely it would suffer if we sounded loud notes for many hours close by the ears. Or shall we, perhaps, find that, if a child is occupied with the acquisition of education and knowledge, the brain suffers injury? Of course, this would suffer if it should be over-worked from morning till night. In its generality the assertion of von Hippel is, therefore, untenable.

2. I contend also that reading and writing *in themselves*, do not produce myopia. Only reading and writing in poor light and in improper positions, and the excessive, hour-long, one-after-another recurring reading and writing produce and favor myopia. Proof: the average very infrequent occurrence of myopia in elementary schools (in five village schools I found 1 per cent.; in twenty public schools 7 per cent. of myopia on the average) who yet write and read as much as the pupils of the gymnasiums. Farther, the increase of myopia in dark public schools (8 to 15 per cent., as against 2 and 7 per cent in light localities).

Also, Kirchner, in his otherwise excellent late work, holds that the acquiring of myopia by a number of children "is a sacrifice which we must make to education, and of necessity must make it, just as we are both compelled and willing to give our life, if required, for the honor and success of our father-land." How can school and army be compared? We do not send the children to school for the defense of our fatherland, but for their education, in which they ought to remain just as healthy as when they went to school.

Farther, von Hippel took up the assertion already made by Javal, "that perhaps a larger per cent. of short-sighted pupils are found in the higher classes because more normal-sighted children may have left school in the middle classes." Any reasonable general cause why only the normal-sighted should depart and the myopic study farther is, of course hard to find. Von Hippel reckoned that, while up to the lower third class the proportion of those going and those remaining was approximately the same; in the higher third class 6 per cent. of

short-sighted pupils departed as against 24 per cent. of myopic pupils, on the average. I went over the calculations and found that only 4 pupils, on the average, left the higher third class. On such figures, no one could seriously build any conclusions.

Moreover, Schmidt-Rimpler recently brought positive proof that perceptibly more short-sighted leave the higher classes than the lower. Among 809 who had left short-sighted were found: from sixth, 12 per cent.; fifth, 16 per cent.; fourth, 17 per cent.; lower third, 33 per cent., higher third, 38 per cent.; lower second, 43 per cent., and higher second, 45 per cent. Besides, it is a gross error to believe that all who leave take up another life calling. In Frankfurt am Main, of 186 who left the gymnasium, 145 went to other schools.

It is to be seen from the above how wrong is the view of those who consider short-sight an unimportant disease. Of course, the introduction of the Darwinian theory that myopia is for people an adaptation to surroundings, to close work and not a disease—one which the great Darwin would not have understood and a very false use of the theory—and the efforts of Stilling, Tschering and von Hippel, to prove myopia an unimportant, harmless anomaly, were very agreeable to the pedagogues, especially to Wingerath and the authorities who are unfriendly to modern hygienic regulations.

The view of other well-known investigators stand diametrically opposed to those of Tscherning, Stilling and von Hippel.

At their head stands Horner, who was himself short-sighted. This makes his testimony of greater weight. Some speak of myopia as *an appropriate adaptation to the act of work*, like the skin of the finger of a violin player, which grows thick. If we wish to continue the idea of adaptation to an end sought with the idea of adjustment to circumstances, this conception of myopia is entirely untrue. In growing years the majority of eyes have no necessity of becoming short-sighted since power of accommodation is fully sufficient for work; and after youth is past short-sight offers more danger than advant-

age. If we wish, considering adjustment alone, to say: "The change is the necessary product of use, of its extent and of its kind, then this is correct. Then let no one forget that adjustment very frequently passes the bounds of health, whether we consider the flat foot of the mountaineer, the emphysema of the trumpeter, the arched back of the professional gymnast, or the short-sight of the student; it is when undue requisition upon the function of the organ is made, and when the function does not observe the right mean between rest and work."

In direct contradiction of the views of Stilling, Horner considers myopia a great hindrance to choice of occupation, and to advancement in life. In many callings of life, especially in the case of the female sex, the wearing of spectacles is impossible, as such powerful glasses are required that they will not wear them at all. "He who has experienced the chagrin of not being able to pursue a cherished calling, of not being able to choose the business calling on account of short-sight, has a right to emphasize this economical side of the matter."

Horner's experiences with the danger of short sight are very correct, and are deserving of the widest dissemination. "The degree of myopia which indicates the bound beyond which danger is almost the rule, is shown by M6 (not 9, as Tscherning believes). Since this degree of myopia is easily reached by those who at twelve years of age have only one-half, a higher grade of myopia is the more dangerous the younger the person is who develops it. Also now a fact cannot be given too great prominence. *"The danger of loss of the very short-sighted eye increases with age, and becomes, on the average, from the age of 50 or over, more threatening.* Of 1,878 short-sighted people whom Horner examined in his practice from 1880 to 1883, 34 per cent. developed dangerous complications; 9 per cent. diseases of vitreous humor; 11 per cent. inflammations of the choroid; 4 per cent. detachment of the retina, and 23 per cent. cataract. The average age of these 629 cases of complicated myopia was 50.3 years.

As is known, special schools have been proposed for the

short-sighted; Horner considers them unnecessary. We rather agree entirely with his words: "It would be better to treat all children as if they might become short-sighted."

Horner comes to the commendable conclusion that the war against myopia and its spread is one warranted by the need of those who are becoming short-sighted, for those who are so, and for those who come after. "Fortunately the battle has broken out all along the line; we should take advantage of it before it flags".

Also Schmidt-Rimpler comes to similar conclusions and holds that the view that the danger from myopia begins with M 9, does not agree with clinical experience. He correctly emphasizes the fact that in spite of correcting glasses, myopia of middle and higher degrees causes loss of keenness of vision for distance.—The following determinations of keenness of vision in the case of 3420 eyes of school-children prove this:

	$\% S > 1 =$	$\% S > 1.2 =$	$\% S < 1.2 =$
E - - -	89	9	2
M 1—3 - - -	60	35	5
M 3—6 - - -	41	50	9
M > 6 - - -	16	65	19
H < 3 - - -	45	31	24
H > 3 - - -	12	38	50
Astigmatism -	1	52	47

Scherdin found in the Real-Schule in Stockholm, as Key reports, normal keenness of vision in the case of only 70% of short-sighted pupils.

Leininberg in Wurzburg examined 2893 myopic eyes for keenness of vision. This was found to be about =1 with M < 2D; S = 0.9 with M 2—4; S = 0.8 with M 4—6; S = 0.6 with M 6—10; S = 0.5 with M 10—12; S = 0.3 with M 12—18; S = 0.2 with M > 18.

Priestley-Smith argues against the view that short-sight is a development of the human eye. He says, "If myopia is an accompaniment of intellectual progress, it is an accompany-

ing evil. If nature had in fact the development of the eye in view, then she ought to change the action of the accommodation muscle and make possible an active accommodation for distance, that the short-sighted person might acquire the ability to see in the distance.

Also Schiess-Gemuseus and Seggel argue warmly against Tscherning's view that myopia induced by reading is to be considered unimportant. Seggel proves the really injurious influence of myopia by the following tables of 1619 myopic eyes examined by him, of which he determined the keenness of vision.

EYES				MYOPIA	AVERAGE KEENNESS OF VISION	
186	-	-	-	0.25	-	1.1
74	-	-	-	0.50—0.75	-	0.92
267	-	-	-	1.00—1.75	-	0.80
239	-	-	-	2.00—2.75	-	0.77
186	-	-	-	3.00—3.75	-	0.75
200	-	-	-	4.00—4.75	-	0.73
173	-	-	-	5.00—5.75	-	0.65
103	-	-	-	6.00—6.75	-	0.59
85	-	-	-	7.00—8.00	-	0.55
68	-	-	-	8.00—10.00	-	0.53
26	-	-	-	10.00—13.00	-	0.40
12	-	-	-	14.00—20.00	-	0.13

Seggel very correctly adds in conclusion: "*Since myopia even in its lowest degree of 0.5 D is accompanied by $S < 1$ and since keenness of vision decreases in proportion to increase of myopia, therefore the combating of myopia, not only on its own account but also on account of the necessarily accompanying decrease of keenness of vision, is a pressing duty not often enough urged.*"

Nagel expresses himself not less energetically. He is a learned investigator and a keen critic. Stilling had proclaimed that myopia caused by work "is not to be taken so tragically", as chanced to be done by several oculists. He says that

higher myopia offers advantages and moderate degrees are harmless, that serviceability of the many is not injured by the increase of myopia, that it is time an end was put to the disturbance made at the expense of the school authorities, that the oculists should have a care not to thrust themselves into the domain of instruction and matters of this kind. Nagel considers all these objections unfounded. "The injury of continued close-work," says he, in spite of all Stilling says with exaggeration of the harmlessness of myopia, remains proved for every unprejudiced observer, and, apart from the connection of cause and the associated theories it is warranted and imperative to combat most earnestly the injury wrought by too early and too severe close work. What has in this matter been gained with much exertion, we should not lightly ridicule and reject."

In similar manner Pflüger attacked the underrating by Stilling of the harmfulness of close-work, and asserted that his unfounded conclusions since they imperilled the progress already made in school-hygiene, must work harm among the laity, especially in the educational world.

We declare ourselves of this opinion after twenty-five years of investigation and we affirm that, in spite of the objections of the above works setting forth the importance of myopia, we are unable to find one author who is not of the opinion that *in the Schools everything should so be arranged that it will not cause injury to the eyes.*

SELECTIONS.

SCOPOLAMINUM HYDROCHLORICUM: A NEW MYDRIATIC, AND ITS USE IN OPHTHALMOLOGY.

According to Raehlmann (*Klinische Monatsblätter f. Augenheilkunde*, February, 1893), scopolamine is set forth by A. Schmidt, of Marburg, as an atropoid alkaloid from the roots of the *Scopolia atropoides*, and, like atropine, hyoscine, etc., belongs to the pharmacological group of the tropeine. As such, the instillation of its watery solution into the conjunctival cul-de-sac causes dilatation of the pupil. According to Ladenburg, scopolamine, as well as hyoscine, are contained in hooscyamus without being identical with the latter. Its chemical combination differs from atropine, hyoscine, etc. It is rather isomeric with cocaine, but naturally yields quite different integral products.

The preparation was given to Raehlmann by Professor Kobert, with the information that, after experiments on the lower animals by internal administration, scopolamine had exhibited an opposite effect to atropine, that its influence on the cortex of the brain was not stimulating, like atropine, but paralyzing. It did not increase the action of the pulse, like atropine, but, on the contrary, retarded its action. These last-named qualities lead to the expectation *a priori* that the local special effects of the new remedy would be different, especially those on the conjunctival vessels.

Raehlmann has made use of scopolamine both on the normal and the diseased eye, and reached the conclusion that, as a

mydriatic and an antiphlogistic, it surpasses all other tropeines, including atropine. In strength of mydriatic effect it resembles hyoscine closely. The remedy does not produce the disagreeable after-effects and double vision which, according to his experience, occurred from the use of hyoscine, but it possesses all the advantages which belong to hyoscine in comparison with atropine.

During the last half-year he has employed the remedy in all cases in which atropine may be used, and has also used it by way of comparison with atropine, and has found that scopolamine is, in many cases, at least, equal to atropine, while in others is entirely superior. But the circumstance which will insure scopolamine an enduring place among ophthalmic remedies is that it can be used for a long time in one of the solutions equivalent to the one per cent. atropine solution without producing the troublesome associated symptoms which so often make the continued use of atropine impossible. It is well known that atropine disturbs the appetite when used as an instillation for any length of time, either in moderate or large doses. He has never seen this or a similar effect from the use of scopolamine. It is only after very large doses of scopolamine that a feeling of dryness of the throat is produced—a symptom which occurs after very moderate doses of atropine. The state of nervous restlessness, with or without a reddening of the face and quick pulse, which is so often found in patients treated with atropine, never occurs after the use of scopolamine. In cases of incipient atropine-poisoning, or in idiosyncrasy towards atropine, scopolamine, therefore, renders the best service, since it more than supplants atropine in its local effect and completely destroys its general effect.

In several cases of iritis, in episcleritis with infiltrations of the sclerotic, etc., when atropine could not be endured any longer, when the powers of the body were depressed on account of want of appetite, and the general condition was as unfavorable as possible, scopolamine not only produced an improvement in the disease of the eye, but it also maintained the general health. The remedy surpasses atropine in influ-

encing pericorneal injection and pannus, and possesses especial advantages in suppurative inflammations of the anterior section of the eyeball. As is known, under these circumstances, especially in suppurative keratitis, serpent ulcer and iridocyclitis, atropine often is inadvisable, while Raehlmann has found in five cases that scopolamine caused a diminution in the size of an hypopyon. The remedy seems to act more favorably than atropine on the suppurating tissues, probably by an effect on the blood-vessels. Scopolamine does not seem to act on the intraocular pressure; even if there is a pathological increase of the tension, the remedy can be borne. Therefore, it is an indispensable drug in inflammatory conditions, especially in iritis, when they occur in glaucomatous eyes. He has used scopolamine with advantage in several cases of chronic inflammation with secondary glaucoma. In one case of absolute glaucoma, with great irritation, strong ciliary injection, and hyphæma, the pain ceased, the eye became quiet, and the blood from the anterior chamber disappeared under the influence of this drug. He has not tried scopolamine in acute glaucoma.

Hydrochlorate of scopolamine operates about five times as powerfully as atropine. It paralyzes, like the latter and in the same degree, the sphincter of the iris and the accommodation. The duration of the effect is ($\frac{1}{5}$ per cent. scopolamine compared with 1 per cent. atropine) about the same, perhaps somewhat shorter with scopolamine than atropine. It is to be used in solutions of one to two *pro mille* ($\frac{1}{10}$ to $\frac{1}{5}$ per cent.), which solutions accordingly correspond in dose to $\frac{1}{2}$ -and-1 per cent. solutions of atropine. Scopolamine operates best when used in divided doses. In a solution of two *pro mille* ($\frac{1}{5}$ per cent.) 6 or 7 drops may be administered daily to an adult, or used every fifteen minutes during one and one-half hours. With children correspondingly weaker solutions are to be used.—*Rep. on Therap. Progress, Therapeutic Gazette.*

NEWS.

THE PAN-AMERICAN MEDICAL CONGRESS.

MEETING AT WASHINGTON, SEPT. 5, 6, 7 AND 8, A. D., 1893.

SECTION ON OPHTHALMOLOGY—Julian J. Chisolm, M.D., Executive President, Baltimore, Md.; George M. Gould, M.D., English-Speaking Secretary, Philadelphia, Pa.; J. Harris Pierpont, M.D., Spanish-Speaking Secretary, Pensacola, Fla.

Circular No. 2.—Office of the President of the Ophthalmic Section.—115 West Franklin Ave.

BALTIMORE, June 16, 1893.

With the object of making the work of the Section on Ophthalmology of the "Pan-American Congress" more interesting and instructive to the members in attendance, I have selected the following topics for discussion, in addition to the reading and condensation of the many papers which will be presented. The second day of the Congress will be devoted to the consideration of "Refractive Errors," the best methods of diagnosis and treatment. On the third day the subject for discussion will be "Muscular Errors," how to detect and correct them.

These two subjects have been selected because their consideration confronts us in our every day work. Patients suffering from refractive or muscular errors fill our offices, and often cause us anxious thought. Such cases really make up a large percentage of ophthalmic practice, and hence to view those subjects from the standpoint of a personal experience,

with the new methods of investigation, cannot fail to be instructive. Early notice of this intention has been given, that every one who expects to attend the Section can come prepared with collated personal experiences, so as to be able to illustrate their methods by facts. Individually we all need guidance over obstructions which often resist our best efforts to relieve suffering, and which prevent us from restoring eyes to the normal condition of painless usefulness. Any papers pertaining to the selected subjects will be read preliminary to the opening of the discussion.

It is hoped that the leading men of the Continent, interested in Ophthalmic Surgery, will try to be present at the meeting of the Congress, and will come prepared to give to others, anxious to hear them, the benefit of their personal experiences and methods of practice.

JULIAN J. CHISOLM, M.D., LL.D.,

Executive President.

THE AMERICAN JOURNAL OF
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NO. 8.

ORIGINAL ARTICLES.

CALOMEL CONJUNCTIVITIS.

Contribution from the Eye and Ear Department of the Baltimore City Hospital
Dispensary.

BY HARRY FRIEDENWALD, A.B., M.D.,

Ophthalmic and Aural Surgeon to the City Hospital and Dispensary; Lecturer on
Ophthalmology and Otology, College of Physicians and
Surgeons, Baltimore,

AND A. C. CRAWFORD, M.D.,

Assistant in the Eye and Ear Department, City Hospital Dispensary.

It has long been known that severe inflammation of the conjunctiva results from the local application of calomel when the iodide of potassium is being administered internally. This fact is interesting not only on account of its importance in ophthalmic therapeutics, but also from the light which it throws upon the manner in which calomel is absorbed into the system, a question still under discussion. Three cases illus-

trating this unwelcome result have occurred during the last three years in the Eye and Ear Department of the City Hospital Dispensary. It need scarcely be mentioned that in all of these cases the potassium iodide had been prescribed without our knowledge by other physicians.

The abridged clinical records of these patients are as follows:

CASE I.—F. H., æt. 45, came Dec. 28, 1890, with a corneal ulcer of the right eye, the result of an oyster-shell injury received one week previously. The galvano-cautery was used, a paracentesis was made to relieve the accompanying hypopyon and iodoform was subsequently applied. By January 19, 1891, the inflammatory symptoms had almost entirely disappeared leaving an extensive corneal opacity. Calomel insufflations were substituted for the iodoform. On March 19, the patient, who had been using the calomel himself, complained of having had "a cold in his right eye for a week." The ocular conjunctiva was found to be very much reddened and swollen, especially on the nasal side, only slightly on the temporal, and likewise in the lower conjunctival fold with the usual subjective symptoms of acute conjunctivitis. On inquiry we learned that he had been taking potassium iodide for one week. Two days after discontinuing the insufflations the inflammatory symptoms entirely disappeared.

CASE II.—W. M., æt. 29, came to the clinic January 29, 1892. His left eye was phthisical from injury. He had corneal ulcers on the right eye, which had been cauterized elsewhere. When seen by us the right cornea was covered with numerous maculae. Calomel insufflations were ordered. On February 2, he returned with severe conjunctivitis of the right eye. The inflammation was especially marked at the outer side and in the inferior fold. The patient stated that he had been taking potassium iodide four or five days. The calomel was discontinued and the inflammation rapidly subsided.

CASE III.—P. L., æt. 50; November 28, 1892. He com-

plained that the right eye was somewhat painful but no cause could be discovered; he was therefore kept under observation. Calomel insufflations were used as a placebo November 30 and December 1. On December 2, he had severe conjunctivitis of this eye. The inferior ocular conjunctiva and that of the inferior fold and lower lid were considerably swollen. There were two grayish white spots of false membrane (necrotic) on the lower palpebral conjunctiva, each about 1-2 mm. broad and 4-5 mm. long. This patient, we learned, was also taking potassium iodide. The calomel was no longer used, and on the following day the inflammation had greatly decreased and the membranes had disappeared.

The picture produced experimentally in rabbits by others as well as by ourselves is identical with that met with clinically, consisting of œdema of lids and conjunctiva, injection of the vessels, profuse lachrymation and mucous or even purulent discharge with the frequent formation of a diphtheritic membrane. Sometimes, if the inflammation is kept up, the cornea will become cloudy and there may be loss of corneal substance.

Some authors mention a discoloration of the calomel flakes lying in the conjunctival sac. This was not noticed in the above cases as they were out-patients, and as the calomel was discontinued as soon as the inflammation was observed. Although other cases resulted in prompt recovery on discontinuing the calomel, all cases on record were not so fortunate. Fricke reports a case¹ in which even after vigorous antiphlogistic treatment, recovery was not complete in eleven days; and in Hennequin's case² partial symblepharon resulted.³

In the case of Fricke the symptoms came on about half an hour after the insufflation, increasing in intensity until not mere-

¹Hamb. Zeits., Vol. 5, 1837, p. 3.

²Gaz. hebdom., 15 fev., 1807.

³Hennequin, from the results of the observation of his case, in which a severe pannus cleared up entirely from the resulting inflammation, proposed the combined internal use of potassium iodide with the external use of calomel for the cure of obstinate pannus!

ly the lids, but also the cheeks and nose became reddened and swollen. There was marked blepharospasm. Experimentally in rabbits the symptoms come on in about the same time; once in fifty-seven minutes.⁴

In order to produce the conjunctivitis the potassium iodide need not be given by mouth. This is shown by the case of Meurer⁵ which resulted from the external use of potassium iodide to an inflamed testicle while a mild mercurial ointment was being used upon the cornea, and by the case of Fleischer in which he experimentally produced it by using the potassium iodide hypodermatically.⁶ It can be shown that neither calomel nor potassium iodide, used alone, produces the above results. That the action of calomel is not purely physical is evidenced by the fact that other physically similar powders have not the same clinical effects.

This question has recently been studied by Schlæfke⁷ and by Fleischer,⁸ who substantially agree as to the interpretation of this phenomenon. Calomel in the presence of animal fluids containing sodium chloride and under the influence of the body temperature is slowly converted into bichloride and free mercury. As the transformation into bichloride is slow and small in quantity, it is believed that its clinical action on phlyctenulæ, etc., is due to its action in the *nascent* state. This view is supported by the following facts:

1. Fleischer found on adding pure calomel to distilled water and allowing this mixture to stand at the body temperature that none was converted into bichloride, but on adding sodium chloride to the same mixture even at the room temperature, the fluid gave the reaction for bichloride at the end of twenty-four hours.

⁴Schlæfke, see below.

⁵Hirschberg's Centralb. f. prakt. Augenheilk. Suppl., 1890, p. 441.

⁶See below.

⁷Schlæfke, Von Graefe's Archiv. f. Ophthal., Vol. 25, 1879.

⁸Deutsch. med. Woch., 1885, p. 459.

2. When a moderately concentrated aqueous preparation of calomel and sodium chloride is evaporated at 40° C. to dryness and the residue extracted with ether, crystals resembling those of corrosive sublimate crystallize from this ethereal extract. Calomel alone treated thus, does not give this result.

3. On placing the aqueous preparation of calomel and sodium chloride in a sealed vessel and suspending by a thread a gold plate just above the surface of the liquid, the whole being placed in an incubator, the gold on the following day will be found amalgamated in places.

4. On placing some of the same mixture in a tube heated to redness and passing the vapors of iodine through, the red iodide will be obtained; if the experiment is performed without the sodium chloride no red iodide is formed.

5. Kammerer⁹ showed that after the insufflation of calomel upon the conjunctiva, mercury could be found in the urine. Alsberg and Vulpus¹⁰ corroborate this statement.

6. Cheminade,¹¹ after hypodermic injections of an aqueous preparation of calomel, sodium chloride and gum Arabic, found free mercury at the seat of inoculation.

7. Fuerbringer¹² showed that on treating broad condylomata with a sodium chloride preparation of calomel, and washing off after a few minutes with water, that the washings yielded free mercury. He also obtained the same result when there was no sodium chloride in the mixture, the NaCl of the tissues acting instead. This is corroborated by Fleischer. These facts taken in connection with Voit's experiments (which proved that by long continued contact of calomel with solutions of albuminous substances, metallic mercury was precipitated), suggest the following reaction, $2 \text{ Hg Cl} = \text{Hg Cl}_2 + \text{Hg}$ as opposed to the other possibility $\text{Hg Cl} + \text{Na Cl} + \text{H}_2\text{O} = \text{Hg Cl}_2 + \text{NaOH} + \text{H}$. That the first reaction is correct is furthermore

⁹Virchow's Archiv., Vol. 59, p. 459.

¹⁰Knapp's Archives of Ophthalmol., Vol. 9, 1890, p. 399.

¹¹Union medicale, 3 s., Vol. 48, p. 219.

¹²Zeits. f. klin. Medicin., Vol. 8, 1884.

supported by the fact that Fleischer's test-material (composed of calomel, sodium chloride and water) always gave a neutral reaction, even when kept at the body temperature. This would not be the case if the second reaction had occurred.

8. The action of calomel, slow and mild, is itself suggestive; the amount of sodium chloride in the secretions is small (at most not more than 0.8% in the tears) and little bichloride is formed at a time; therefore its mild action when used alone. In the retort the transformation of calomel is likewise slow and the resulting bichloride small in amount. Vulpus was able to secure a demonstrable amount of mercury from the collected urine of ten days, during which about 1 mgr. of calomel was insufflated once daily.¹³

Hirschberg is also of the opinion that calomel is transformed into bichloride; he states¹⁴ that the astringent action exercised by calomel upon phlyctenulæ is due to the resulting bichloride in *statu nascendi*.

Potassium iodide taken internally rapidly appears in the secretions and excretions, (tears, urine and saliva). Schlæfke using a dose of 1 part potassium iodide to 6,000 of body weight, detected it in the aqueous humor of a rabbit by means of palladium chloride in 8 min., and in the tears in 10 min., after its ingestion. In another rabbit, after a dose of 1-10,000, the tears reacted for potassium iodide nine hours after its ingestion. Potassium iodide is not as readily eliminated by the tears as by the urine or saliva. Schlæfke, after a dose of 2 grams, failed to find it in his conjunctival sac, while his urine and saliva reacted markedly for it, even on the following day. Since one can only detect 1 part potassium iodide in 15,000 of water by means of palladium chloride and as the body weight of the adult is about 60 kilos, at least 4 grams must be administered *per diem* in order to produce the reaction. After using 5 grams twice a day, potassium iodide is continuously present in demonstrable quantity in the tears.

¹³Loc. cit.

¹⁴Einführung in die Augenheilkunde, p. 19.

If a solution of any mercurous salt is treated in a test-tube with potassium iodide, mercurous iodide (HgI) is thrown down as a golden salt, which being very unstable, readily decomposes into mercuric iodide (HgI_2) and free mercury. When mercurous iodide is thus treated with potassium iodide it undergoes the same transformation but the resulting iodide combines with the excess of potassium iodide, forming a double salt and liberating metallic mercury, probably as follows: $2\text{HgI} + 2\text{KI} = \text{K}_2\text{HgI}_4 + \text{Hg}$.

By treating any mercuric salt, as the bichloride, with potassium iodide, mercuric iodide is formed which readily dissolves in a solution of potassium iodide forming a double iodide or iodo-mercurate.¹⁵

As has been shown, the combined use of potassium iodide internally and calomel externally, produces the same compounds in the conjunctival sac, *i. e.*, potassium iodide being eliminated by the tears, and bichloride of mercury resulting from the decomposition of the calomel, together with the excess of calomel; we should therefore expect them to react in the above manner and experiments carry out this expectation. Experimentally and in some of the cases which were under continuous observation as one of Fricke's, the first change noted was a golden greenish discoloration of the calomel, coming on in rabbits, in from 20 to 30 minutes, suggesting by its color the formation of mercurous iodide. This change of color initiates the onset of the inflammatory symptoms. Thus Schläfke added to 1% solution of potassium iodide a little calomel, and shaking this, a dirty green precipitate formed, the calomel finally dissolving. On placing 2 to 3 drops of the golden green filtrate in the conjunctival sac of a rabbit, the conjunctiva was found after a few minutes, reddened, chemotic, the cornea cloudy, with slight conjunctival eschars.

From the filtrate Fleischer obtained the double iodide of potassium with both mercurous and mercuric iodides. In order to show that it is non-essential whether mercurous or mercuric iodides

¹⁵Kemsen, *Inorg. Chem.*, p. 623.

were present Schlæfke prepared two solutions, one of mercurous iodide in potassium iodide, the other of the corresponding mercuric salt in potassium iodide. In the conjunctival sac of one eye he placed a few drops of the first solution, carefully protecting the cornea, the other eye was similarly treated with the second solution; in half an hour both eyes showed marked chemosis, finally leading to the formation of pus, and eschars at the junction of the ocular and the lower palpebral conjunctiva.

We may conclude, 1, that part of the calomel is transformed into bichloride; 2, that the potassium iodide in the tears combines with this bichloride forming the mercuric iodide and meeting the rest of the calomel forms mercurous iodide, part of which in turn gives rise to mercuric iodide and metallic mercury, while the remainder combines with the excess of potassium iodide forming a double salt with liberation of free mercury; 3, that mercuric iodide arising from the combination of the bichloride and potassium iodide, and also from the decomposition of mercurous iodide, combines with the potassium iodide forming a double iodide; and, 4, that both the above double iodides dissolving in solutions of potassium iodide or of sodium chloride act as caustics.

Returning to the clinical side of this question a few words may be added concerning the recognition of the disease. The inflammation differs from the ordinary acute conjunctivitis in being sharply limited to one part of the conjunctival membrane, usually the lower part of the ocular conjunctiva and that lining the lower lid. When very intense it may involve the conjunctiva of the upper fold, but this is rare. The cornea is not involved excepting when the inflammation is very intense as in experimental cases. In all cases which have come under our observation the disease was monocular but it is frequently binocular. Small or large patches of diphtheritic membrane are frequently seen in the lower conjunctival folds, where the little flakes of calomel collect.

Hirschberg (*loc. cit.*) believes that it is only when the potassium iodide is immediately followed by the calomel insufflation

that the above inflammation ensues. This cannot be accepted, for Schlæfke, using doses of 0.5 gram, found that the insufflation of calomel twenty hours after the last dose, resulted in irritation. In our cases the doses of the iodide were moderate and had not been taken just before the calomel was insufflated.

It is scarcely necessary to mention that other preparations of mercury beside calomel may be followed by the same results. The most common perhaps are the oxides and the ammoniated mercury.

On the other hand, the iodide may be taken in other forms, as in the syrup of the iodide of iron.

Judging from the chemical action we would conclude that the bromides would have similar effects and this is borne out by Bellini.¹⁶

In conclusion another form of calomel conjunctivitis may be mentioned. This is due to the use of impure calomel, containing the bichloride or free hydrochloric acid. A serious case caused by the latter contamination was published by Hotz.¹⁷ But this form of calomel conjunctivitis is very rare.

¹⁶See Schlæfke, loc. cit.

¹⁷Knapp's Archives of Oph., 1882.

SOCIETY PROCEEDINGS.

AMERICAN OPHTHALMOLOGICAL SOCIETY.

TWENTY-NINTH ANNUAL MEETING HELD JULY 19 and 20,
1893, AT FORT GRISWOLD HOUSE, NEW LONDON, CONN.

The Society was called to order by the Vice-President, Dr. George C. Harlan, of Philadelphia.

THE RELATION OF THE PATELLAR TENDON—REFLEX TO SOME OF THE OCULAR REFLEXES FOUND IN GENERAL PARALYSIS OF THE INSANE.

By Dr. Charles A. Oliver, of Philadelphia.

The following formulations were offered.

1. In some of the cases in the second stage of the disease, especially where the patellar tendon-reflexes were unequally exaggerated, there appeared to be an irregular and unequal spastic innervation of the two irides, causing irregularities in pin point pupil forms.

2. In a few cases, especially in the third stage of the disorder, where the patellar tendon-reflexes were unequally diminished, the pupil-size though small and its shape though somewhat irregular, seemed to be but little acted upon by any powerful mydriatic.

3. In many cases, especially in comparatively young subjects in the third stage of the disease, where the patellar tendon-reflexes were unequally diminished there appeared to be an unequal paralytic innervation of the irides; the pupillary

dilatation manifesting itself at times, though not as a rule, in the eye with the greater amount of objective optic head-degeneration and retinal change.

4. In a few cases (especially in men beyond middle life) in the third stage of the disorder, where the patellar reflexes were markedly diminished and where the ataxies were quite pronounced, there were marked temporary assymetries of pupillary form, one often being quite small and irregular for several examinations, whilst its fellow was large and ovoid or oval.

5. In quite a number of cases, especially in the advanced stages of the disease (although seen in a number of cases in their earliest stages) when the patellar tendon-reflexes were unequally exaggerated or diminished, there was a failure of the irides to respond to even major degrees of light stimulus; this being true not only for those subjects exhibiting a true spastic myosis but more especially shown in those instances where with partial dilatation of the pupil, mydriatics failed to act.

6. In many instances, especially in the older cases, where the patellar tendon-reflexes were, as a rule, unequally diminished or even lost, there was not only failure of iris-response to the strongest light stimulus carefully thrown upon the retina, but, where obtainable, the irides seemed to fail to react to the various coarse and rough subjective and objective procedures necessary to be used in order to evolve both separated and associated efforts for accommodation and associated efforts for convergence.

7. In some instances, where ciliary muscle innervation could be satisfactorily obtained, both the spastic excitation and the paralytic innervation at times found by subjective reading tests and objective study with the retinoscope, seemed to be in direct ratio with the patellar tendon-reflexes as the iridic changes.

8. In quite a number of changes where there was marked irregularity of the pupils with more or less want of reaction of the irides to light stimulus, the patellar tendon-reflex on the

side of the larger pupil seemed to be the one the more greatly diminished.

9. In a number of instances, especially during the very earliest stage of the disease, where the patellar tendon-reflexes were beginning to lessen to unequal degrees, there often appeared momentary secondary ataxic dilatation of the pupil during exposure to strong light stimulation.

In many cases, especially during the second stage of the disorder, when the patellar tendon-reflexes began to become irregular and inconstant, pupillary inequalities as expressive of unequal iris innervation and action, became more and more constant.

CLINICAL HISTORY OF A CASE OF SPINDLE-CELLED SARCOMA
OF THE CHOROID, WITH A STUDY OF THE MICRO-
SCOPIC CONDITION OF THE GROWTH.

By Dr. Charles A. Oliver, of Philadelphia.

The patient, a man 34 years of age, consulted the writer on account of trouble with the left eye. Five years previously he suddenly noticed that objects situated to the right became dimmed when he attempted to look at them with the left eye. This gradually and painlessly extended over the whole field of vision until in a little more than three year's time, the eye became blind.

In 1890, the tumor of the choroid was discovered by Dr. J. H. Thompson, of Kansas City. There was a history of syphilis but treatment had no effect upon the growth, and a diagnosis of sarcoma was made and an operation urged but not accepted.

When seen by the writer in June, 1892, a large vascular growth was seen in the upper part of the globe. Immediate enucleation was advised and accepted. The operation was done the following day. The patient has recently been seen and is perfectly well with no evidence of return.

Microscopical examination showed the growth to be a spin-

dle celled sarcoma. Sections and photographs were presented.

SARCOMA OF THE CHOROID.

By Dr. Emil Gruening, of New York.

The patient, a woman aged 30 years, was seen April 17, on account of diminution of sight in the right eye. The ophthalmoscope showed the retina in the macular region pushed forward. This projection was about four discs in diameter. This had given rise to no symptoms with the exception of a scotoma. Sarcoma was diagnosed and the eye was removed. Examination showed the growth to be a spindle-celled sarcoma.

SARCOMA OF THE EYE LID.

By Dr. Emil Gruening, of New York.

This affection is exceedingly rare, the case reported being the only one seen by the author. The patient was a young man 23 years old. He came under observation January 1, 1893. Five years previously he had noticed a small swelling in the lower lid of right eye. This bled freely and irregularly. It was operated on in another city but soon recurred. When seen it was as large as a hazelnut and involved two-thirds of the lid which readily bled. The skin covering the mass was freely movable. A small portion of the growth was removed and found to be sarcoma. The tumor with the entire thickness of the lid was then removed and the lid restored by a plastic operation.

Dr. H. Knapp in the discussion reported two cases of traumatic sarcoma of the lid, both terminating fatally.

TUMOR OF THE IRIS, PROBABLY TUBERCULAR.

By Dr. George C. Harlan, Philadelphia.

The patient, a male child, was born September 6, 1890. In

February, 1893, weakness of the right eye with photophobia and lachrymation was noticed. The child was first seen March 6, 1893. There was some conjunctivitis but no chemosis. There was a small posterior synechia. A number of small yellowish white rounded nodules were noticed on the periphery of the iris. These increased rapidly in size and others were added. The deposit increased rapidly and soon filled the upper outer third of the anterior chamber and completely covered the pupil. Intense photophobia of the sound eye developed and exucleation of the diseased eye was done March 15. After the operation the condition of the child rapidly improved. Microscopical examination indicated that the lesion was probably tubercular, although bacteriological examinations gave negative results.

REFLECTIONS UPON A DISASTROUS CASE OF OPHTHALMIA
NEONATORUM.

By. Dr. B. Alex. Randall, of Philadelphia.

Dr. Randall referred to the great importance of strong clear-cut expressions in relation to preventible disease in order that the community and the profession may be properly aroused to the dangers of the situation and spurred to thorough and persistent efforts to combat them. Yet such expressions have danger to those using them and to others, some careful precautions may fail to prevent the disease or bring it to a successful termination. This point was brought painfully home to him by a diastrous case of ophthalmia neonatorum in which he could find no fault with the prophylactic or the therapeutic measures, yet both eyes were lost. Some authoritative statements as to the preventability and curability of the disease were repeatedly called to the attention of himself and the accoucheur. He wished to protest against too uncompromising claims as to the powers of medical measures, since such may be two-edged weapons which turn most seriously against their authors or other medical men who have really done all that human means can do.

CLINICAL NOTES ON SOME REFRACTIVE AND MUSCULAR
CASES.

By Dr. B. L. Milliken, Cleveland, Ohio.

In very high degrees of astigmatism the use of the ophthalmoscope is the most satisfactory method of determining refraction. Six cases were cited where attempts were made to correct by the ordinary means of testing with no satisfactory results, while the ophthalmoscope gave most excellent corrections. In one case, a lad of 13 years, with history of fronto-temporal headache for years, had a high degree of mixed astigmatism in the left eye which, under a mydriatic, gave no satisfactory results, but with the ophthalmoscope the following was obtained, the right eye having only a moderate degree of astigmatism: O. S.+4 D. cyl. ax. 10° \subset 4 D. cyl. ax. 110° V= $\frac{6}{1x}$. This glass with the proper one for the right eye gave great relief, and has been worn with comfort.

In another case that of a man aged 39, there was high mixed astigmatism in both eyes and especially marked in the right eye which, with a mydriatic, had to be worked out with the ophthalmoscope and gave the following: O. D.—10 D. cyl ax 90° \subset + 7 D. cyl ax 180° = V.= $\frac{6}{1x}$. O. S.—6 D. cyl ax 100° \subset 4 D. cyl ax 10 V= $\frac{6}{1x}$. These glasses have been worn constantly for two years with the greatest comfort, the man working all day at book-keeping. The ophthalmometer showed great irregularity in the images and could not be used with any accuracy in testing the refraction.

Several cases were reported showing what could be done with prisms in correcting muscular insufficiencies, and the question was brought out as to the advisability of wearing prisms at various angles for the purpose of correcting both a lateral and a vertical muscular insufficiency with the same glass; for instance, in a case of a lateral insufficiency of say 10 and a vertical insufficiency of 10, one at 90° and the other at 180° , place a 2 prism at 45° or 135° right or left as the case may be. The histories of several cases of this kind were

given in which patients had worn the glasses thus with much benefit, and a trial of this kind was urged.

SEVERAL CASES IN WHICH THE VERTICAL DIPLOPIA TEST
PROVED UNTRUSTWORTHY.

By Dr. Samuel Theobald, of Baltimore.

Four cases were described in which the cover test showed a high grade of exophoria both in distant and near vision, but in which the vertical diplopia test failed entirely to demonstrate the presence of the condition, in some of the cases even indicating esophoria. In one of these cases and also in a case of esophoria, the notes of which were given, it was found that when, during the application of the vertical diplopia test, the cover test also was employed, a squint would show itself in the excluded eye, which the vertical prism failed to bring out, and which would disappear upon the removal of the cover, though the vertical diplopia was still maintained, showing that the latter had no controlling influence over the action of the lateral muscles. The cases, such as described in which the vertical diplopia test proved untrustworthy, are, however, comparatively rare, and the writer still employs it daily and considers it of the greatest value.

AN ADDITIONAL NOTE IN REFERENCE TO THE CASE USEFUL
VISION MAINTAINED BY MEANS OF A TOTALLY DIS-
LOCATED LENS, HERETOFORE REPORTED TO
THE SOCIETY.

By Dr. Samuel Theobald, of Baltimore.

The feature of interest was that a fragment of the dislocated lens, the capsule of which had ruptured two years before, fell through the pupil into the anterior chamber, where it remained for six months resisting the solvent and opacifying action of the fluids of the eye so completely as to retain its transparency and its sharply cut angles. It closely resembled

a bit of yellowish glass and might easily have been mistaken for a foreign body. As its presence in the anterior chamber began to cause considerable irritation, the pupil was dilated and it was caused to fall again into the vitreous body, its return to the anterior chamber being prevented by the application of a myotic. This was followed by the disappearance of the irritation which has not since returned. The insolubility of the lens fragment is the more remarkable in view of the fact that the patient was but two years old at the time the lens capsule ruptured.

A SERIES OF WOOL FOR THE READY DETECTION OF COLOR BLINDNESS.

By Dr. Charles A. Oliver, of Philadelphia.

The following modification had been made by the writer in the Holmgren series:

Five individual tests are employed, pure green, pure red, rose, pure blue and pure yellow.

Loose and separate skeins of wool were employed. The colors were made of equal relative intensity. The value of the color used in each test skein was expressed. The set was so constructed that it could be used by any intelligent layman.

The test was so constructed that passing color changes could be preserved and permanently kept from future comparison.

The test was so constructed that written and verbal expressions of the character and the amount of the subnormal color perception could be given.

The wools were made of one grade of manufacture and dyed with vegetable material.

After several years trial the writer found that he could dispense with all but the five principal test skeins, five pure match skeins and eighteen confusion skeins of relative equal value to the pure match skeins.

AFTERNOON SESSION.

GOUTY RETINITIS, CHORO-RETINITIS AND NEURO-RETINITIS.

By Charles Stedman Bull, M.D., of New York.

The paper was based upon a study of the retinal changes found in over one hundred cases of gouty patients. Five of these cases (two with autopsy) were reported in detail.

The points to which attention were drawn were.

1. The changes in the fundus are always bilateral though rarely symmetrical in the two eyes.

2. The degeneration in the walls of the bloodvessels and in the retina cause marked impairment of central vision, little or no impairment of peripheral vision, and never end in blindness.

3. The loss of central vision is always progressive up to a certain point, unless the cause of the disease is recognized early in the outset and immediately and properly handled. Improvement of the vision after the disease is established cannot be expected.

4. Hemorrhages into the retina are rare except in the beginning of the disease. Their absence later is probably due to the fact that the strength of the vascular wall is increased by the deposit, though its elasticity is diminished.

5. The most marked feature in the fundus is the development of the arterio-sclerosis and phlebo-sclerosis. This is seen by the ophthalmoscope in the vessels of the retina and the microscope shows that the degeneration exists as well in the vessels of the choroid and optic nerve.

6. Another almost pathognomonic symptom is the peculiar yellowish granular exudation in the retina, located by the ophthalmoscope around the posterior pole of the eye and generally leaving the macula intact and proved by the microscope to be mainly in the nerve-fibre layer, though found in all the layers except that of the rods and cones.

7. The changes in the optic nerve-fibres seem to be almost entirely intra-ocular and cannot be traced for any great distance back of the eyeball.

RETINITIS PUNCTATA ALBESCENS.

By Dr. Myles Standish, of Boston.

These cases are not uncommon yet the literature of the subject is surprisingly small for a condition which presents such a striking picture to the ophthalmoscope. The majority of the cases come on account of some discomfort in the use of the eyes, and the white, rounded glistening spots are discovered in the retina in the course of the examination. After a time comfort in the use of the eye returns, but without the spots disappearing. What the substance is that produces the appearance is undetermined. A case was reported which was of special interest as it apparently filled out the clinical history of these cases in the prodroma and acute stages.

REMOVAL OF HARD CATARACT BY SUCTION.

By Dr. Lucien Howe, of Buffalo.

It is probable that every operator has occasionally experienced difficulty in completing the final act of extracting the lens. In order to obviate this difficulty the writer had employed an instrument similar to a large dropping tube, by means of which a partial vacuum could be made. The tube was applied to the protruding lens, enabling the operator to draw it out.

Dr. Frank W. King, of New York, exhibited an ocular mask of papier mache, to be used for the protection of the eye after cataract operations.

THE ARTIFICIAL RIPENING OF CATARACT.

By Dr. Edward Jackson, of Philadelphia.

A series of cases were reported which had been treated by

tapping the anterior chamber, drawing off the aqueous humor and massage of the lens through the cornea as suggested by Pooley and advocated by White.

The operation was followed by very little reaction, there being no iritis or posterior synechia in any case. In patients over 50 years of age the operation was followed by rapid increase in the opacity of the lens and early maturity of the cataract. In patients under 35 years of age no effect upon the existing lens opacity was produced.

The author concluded that this method of ripening cataract was certainly more efficient than that of Foerster—iridectomy and massage; was almost entirely free from danger and was probably a better means of avoiding prolonged practical blindness than the extraction of the immature cataract.

A CASE OF TRAUMATIC DISLOCATION OF THE IRIS UNDER
THE UNBROKEN CONJUNCTIVA. THE EYE DAMAGED
BUT PRESERVED. TYPICAL SYMPATHETIC OPHTHALMIA
IN THE OTHER EYE.

By Dr. Herman Knapp, of New York.

Mr. M., age 45 years, came under observation December 21, 1893. Ten days before his left eye had been struck by the head of a small pet dog with which he was playing. The eye had been red and black ever since, but not painful, the sight impaired. On the inner side of the cornea and 2 mm. from its margin the conjunctiva was raised by a black mass which proved to be the iris. The conjunctiva showed no wound or scar. The whole iris was found absent from its normal position. The lens was in place and transparent. There was no neuro-retinitis or isolated rupture of the choroid. Vision equaled $\frac{15}{cc}$. The right eye was free from any irritation. The patient was directed to bandage the injured eye lightly and not use the other eye and keep quiet. Everything did well until 29 days after the accident, when symptoms of sympathetic inflammation appeared in the right eye. Under active

treatment the attack subsided but relapses occurred, and vision in the right eye was completely lost. In the left eye vision equaled $\frac{2}{cc}$, and the displaced iris has shrunk to a flat blackish mass scarcely raised above the conjunctiva.

THURSDAY MORNING SESSION.

REMOVAL OF STEEL FROM THE VITREOUS WITH THE ELECTRO-MAGNET.

By Dr. E. E. Holt, of Portland Me.

The writer had previously reported six cases treated by this method. In the present paper he reports three cases. In all the piece of steel had entered through the anterior chamber, fracturing the lens. The conjunctiva was separated and an incision made through the sclerotic back of the equator of the eye, the knife in each instance striking the foreign body. The electro-magnet was then introduced and the steel removed. The lens was subsequently absorbed and good vision obtained in every case, notwithstanding the fact that in the third case there was pus in the anterior chamber when the case came under observation.

A PERMANENT MAGNET FOR USE IN REMOVING FOREIGN BODIES FROM THE CORNEA,

Was described by Dr. Walter B. Johnson, of Patterson, N. J.

It consists of a bar of steel cone-pointed and elongated at each end. It is charged by rotating it within the magnetic field of a generator. It will continue in full magnetic strength for a long time. It has served an excellent purpose on several occasions in removing small particles of steel from the cornea which had perforated and almost entered the anterior chamber.

SUPPRESSION OF THE VISUAL IMAGE.

By Dr. Walter B. Johnson, of Patterson, N. J.

In convergent strabismus there is present an amblyopic condition affecting the squinting eye. Hypermetropia was considered by Donders and others as the most frequent cause of convergent squint, exciting excessive efforts at accommodation, resulting in convergence, confusion of images and subsequent mental suppression of visual image in one eye, finally terminating in an amblyopic condition. It has been claimed by Schweigger, Alfred, Graefe and others, that amblyopia is not caused by squint, but exists as a primary or congenital condition. This produces convergence in consequence of confusion of images. The variety of amblyopia in question is apparently a purely physiological condition, the fundus being normal. The amblyopia is sometimes overcome by correction of the visual defects, but vision in the amblyopic eye rarely becomes equal to that of the fellow eye.

The following case was reported. T. K., age 19, had been cross-eyed since the age of three years. He has never been able to discover any object with left eye. There was hypermetropia in right eye. Vision in left eye equaled fingers at six inches. On June 13, enucleation of the right eye was required as the result of accident. June 18. Vision in left eye had increased to fingers at three feet. Examination showed a hypermetropia of 1.50 D. Under careful practice and instruction the vision in left eye rapidly improved, so that by July 1, he could read ²⁰/_{XV} with correcting glass and Jaeger No. 1, at twelve inches. Examination three years after the loss of the eye showed that the improvement had continued.

In this case whatever was the change which led to the loss of vision, it was not structural either in the eyeball or the nerve centers, but was in all probability pure amblyopia which resulted from the long continued mental visual suppression.

A CASE OF CONGENITAL CYST OF THE ORBIT WITH ANOPHTHALMUS.

By Dr. George C. Harlan, of Philadelphia.

The patient was a well developed and healthy child five months old. The left eye and appendages were perfectly normal. A tumor about the size of a small hen's egg filled the right orbit and projected considerably beyond it. The orbit was fully of adult size and the lids distended to more than twice their normal size. The skin was movable and natural in appearance. The cilia were well developed. The lids were separated about 2 cm. The exposed conjunctiva was congested but not much changed. There was no discharge. There was nothing to mark the position of the cornea. There was no movement in the tumor. No pulsation and it was incompressible. Fluctuation was decided but very tense.

As the tumor was growing and the deformity great, it was decided to remove it. Incision through the conjunctiva gave exit to a quantity of clear watery fluid. The cyst was simple, the outer portion being fibrous and tough, and the inner delicate, semi-transparent and bluish.

The child died 24 hours after operating, apparently from exhaustion following upon shock.

A careful inspection of the orbit was made after death. There was no connection with the intra-cranial cavity. There was no indication of any aperture. Nothing resembling an eye could be found in the extirpated cyst, though at the bottom of the sac there was an undefined mass of tissue.

A review of the literature was given, and the author concluded that the tumor was probably formed of the embryonic tissues of the eye, and that it was either an exaggerated hydrophthalmus, or a foetal encysted coloboma which by its early inception and enormous growth had prevented the evolution of the eye.

RESTORATION OF THE UPPER EYE-LID BY MEANS OF A FLAP
TAKEN FROM THE CHEEK.

By Dr. Samuel B. St. John, Hartford, Conn.

The authour demonstrated a method which was applicable to cases in which the upper lid had been destroyed by disease or injury, or in which the lid was removed by operation. In making the flap the incision commences about half an inch in front of the ear and runs forward below the lower lid about half an inch, and continues until the side of the nose is reached. It is then carried downward and until the flap is of sufficient width and then taken backward. The flap is next separated and secured by numerous stitches to the fastened surface above. The gap left is closed by separating the tissues of the cheek below the wound and sliding them upward.

EXECUTIVE SESSION.

The following were elected to membership: Dr. F. E. Cheney, Boston; Dr. Charles H. Thomas, Philadelphia; Dr. Wm. H. Wilmer, Washington D. C.; Dr. H. B. Chandler, Boston; Dr. J. E. Weeks, New York; Dr. George Fiske, Chicago; Dr. Edward Friedenberg, New York; Dr. William Cheatham, Louisville, Ky.

Officers for ensuing year.

President—Dr. George C. Harlan, Philadelphia.

Vice-President—Dr. O. F. Wadsworth, Boston.

Secretary and Treasurer—Dr. Samuel B. St. John, Hartford, Conn.

Corresponding Secretary—Dr. J. S. Prout, Brooklyn.

The Society adopted a by-law limiting the membership to one hundred and fifty.

Adjourned.

W. H. MORRISON.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

HENRY POWER, M.B., F.R.C.S., President, in the Chair.

THURSDAY, JUNE 8, 1893.

TUMOR OF THE OPTIC NERVE.

Dr. Rockliffe (Hull) read notes of this case. The patient, a male, aged 20, was shown to the Society in March, 1892, as a case of monocular proptosis. In December, 1892, being emaciated, anæmic, and losing weight, the eyeball and growth were removed *en masse*. Mr. Treacher Collins kindly examined the specimen and reported as follows: "The tumor is situated in the region of the optic nerve, and is covered by a distinct thin capsule, which is continuous with the sclerotic, and is apparently the expanded dural sheath of the optic nerve. The tumor is oval in shape, and about equal in size to the eyeball itself. Its longest diameter measures 27 mm., and its narrowest 21 mm. It is of a greyish-brown color. An antero-posterior vertical section showed the parts of the eye in their normal position and apparently healthy. The vitreous is of good consistency, the optic disc not swollen. The growth commences two mm. behind the globe, expanding the dural and pial sheaths and pressing the lower portion of the nerve downwards; this is seen as a distinct white band running along the lower border of the growth." Microscopically Mr. Collins describes the tumor as consisting of nucleated cells, which have numerous delicate branching processes, interlacing with one another and forming a network the spaces of which are

of very different shape and size; in addition, there are bundles of closely-packed nucleated fibres and a few thin-walled blood vessels. Both pial and dural sheaths encircle the growth. The appearances resemble very closely those seen in gliomatous tumors of the brain, and the tumor probably originated in the neuroglia of the optic nerve. Dr. Rockliffe referred to the rarity of such tumors, and quoted cases recorded by Brailey, Hulke, Lawson, and others, and considered the symptoms of tumor of the optic nerve to be: Slowly but progressively increasing proptosis and loss of vision, with absence of pain and constitutional derangement, the external appearances of the eye and fundus oculi being normal with the exception of proptosis and dilated retinal veins, and possibly some atrophy of the nerve, accompanied with symptoms of posterior pressure on the globe. If the tumor sprang from the sheath the displacement would probably be forwards and non-central and the movement of the globe limited; but if from the nerve, the proptosis would be central, with no limitation of movement of the globe. He suggested the advisability of taking the field of vision in such cases as likely to lead to more exact diagnosis. The paper was illustrated by specimens and drawings.

ON THE COMBINED METHOD OF CATARACT EXTRACTION.

This paper was read by Mr. Swanzy. The author advocated the combined in preference to the simple method for the extraction of cataract, and reported on 100 consecutive operations for uncomplicated senile cataract by the former method. The results obtained were: 95 good, 2 medium and 3 failures. The three failures were due to iritis. The accidents and irregularities which occurred during the operation were. Loss of vitreous in small quantity twice. Hemorrhage in the anterior chamber such as to interfere with the normal progress of the operation three times. Section too short four times; in two of these it was lengthened with scissors. Some cortical remains

were left twenty-seven times, but in all except three it was insignificant in amount. Reflex vomiting during and after the operation was seen twice in different patients. No case of suppuration occurred, careful antiseptic measures being regularly employed. There were six cases of plastic iritis. Marked striped keratitis occurred six times, besides frequently in slighter degrees, but in no instance did it leave permanent damage behind it. The incision occupies the upper third, or a little more, of the corneal margin. A coloboma of about 3.5 millimetres was made, and great pains were taken to reduce each of the pillars into the anterior chamber completely. Such a coloboma was sufficient to obviate secondary iris prolapse by providing a way of exit for the aqueous behind the iris when the wound happens to be ruptured during the first few hours of the healing process. In this series incarceration of the iris occurred only once, and that was in one of the cases where reflex vomiting took place. As one of the final steps of the operation Mr. Swanzy lays much stress on search with forceps for any tag of capsule which may lie in that part of the wound which correspond to the coloboma. If such a tag were captured it was drawn out and snipped off, and thus prevented from becoming incarcerated in the wound during healing. In 18 instances out of the 100 capsule was found in the wound and abscised.

The President, in thanking Mr. Swanzy for his paper and congratulating him on the excellence of his results, said that he was unable to agree with him on the question of iridectomy in extraction of cataract. He much preferred the simple operation, and believed he obtained better results therefrom than by the combined method. He mentioned a case in which serious damage to the cornea followed the incautious use of a strong solution of cocaine.

Mr. Critchett expressed his preference for extraction with iridectomy. He also referred to the danger to the cornea of the too liberal use of cocaine; he had for some time been in the habit of applying a drop or two of cocaine solution to the

iris before doing the iridectomy, and with altogether satisfactory results.

Dr. Drake-Brockman said that he had abandoned iridectomy in his cataract operations since 1878. He had performed a very large number of extractions by the simple method since that date, and was satisfied with the general results. He was unable at the time to give the actual figures, but thought that prolapse of iris occurred in about six per cent.

Messrs Tweedy and Adams Frost expressed themselves in favour of the combined method of operation.

Mr. Hill Griffith mentioned some of the results obtained at the Manchester Eye Infirmary by both procedures. The figures, so far as they would bear comparison, were slightly in favor of the simple operation.

Mr. Richardson Cross was of opinion that it was inexpedient to conclude that all cases must be treated by one plan of operation. He thought the simple operation most suitable for a certain proportion of cases, the combined method for others.

Mr. Swanzy replied briefly to the remarks of the above-mentioned speakers. He thought that probably those operators who had given up iridectomy in cataract extractions had been accustomed to remove a large piece of iris, and so leave a disfiguring coloboma, and one which for visual purposes was objectionable. If a small iridectomy were performed he did not think these objections could be very seriously raised.

LIVING AND CARD SPECIMENS.

Mr. Juler—Microscopic Sections of Ciliary Sarcoma.

Mr. John Griffith—Specimens of a Tumor of the Ciliary Body.

Mr. Haydon—Ruptured Choroid with Perforations of the Iris.

Mr. Stanford Morton—Pemphigus of the Conjunctiva.

Mr. Marcus Gunn—Pemphigus of the Conjunctiva.

Mr. Lawford—New Growth in Ocular Conjunctiva.

Mr. Donald Gunn—Congenital Ophthalmoplegia Externa in Two Brothers.

Mr. Doyne—Drawing showing a cherry-red spot at the Macula.

Mr. Earnest Clarke—Nævus of Right Side of Face, Lids, and Conjunctiva, with Cataract in Right Eye.—*British Medical Journal*.

NEWS.

SECTION OF OPHTHALMOLOGY, PAN-AMERICAN MEDICAL CONGRESS.

MEETING: WASHINGTON, SEPTEMBER 5, 6, 7 AND 8, 1893.

The following papers have thus far been announced:

REFRACTIVE ERRORS.

1. Further studies of the cycloplegic value of Homatropin and Cocaine disk as a substitute for Atropin and Hyosciamin, by Dr. Casey A. Wood, of Chicago.

2. The relation of Skiascopy to other tests for the determination of the ocular refractions, by Dr. H. V. Wurdemann, of Milwaukee.

3. The necessity for complete suspension of accommodation by mydriatics in the adjustment of glasses, by G. C. Savage, of Nashville.

4. A contribution to Refractive Errors, by Dr. J. C. Morgan, of Philadelphia.

5. Refraction Anomalies of Artists, by Dr. J. C. Morgan, of Philadelphia.

6. Astigmatism following Cataract extractions and other sections of the cornea, by Dr. Edward Jackson, of Philadelphia.

7. A few thoughts about Ophthalmometry, as to what the Javal Instrument will do, and what it will not, by Louis J. Lautenbach, of Philadelphia.

HETEROPHORIA.

8. A clinical study of Heterophoria, by Hiram Woods, of Baltimore.

9. An analysis of fifty cases of Internal Squint, by H. F. Hansell, of Philadelphia.

10. Some forms of Anomalies in Eye Muscles, by Dr. E. J. Gardner, of Chicago.

11. Affections of the Nose as a cause of the want of concordance of the action of the Eye Muscles, by Dr. W. Cheatham, of Louisville.

12. Further experiences in graduated Tenotomy, by Dr. Chas. H. Thomas, of Philadelphia.

MISCELLANEOUS.

13. Treatment in six cases of "Irido-Cyclitis" complicated with cataract, by Dr. Robt. L. Randolph, of Baltimore.

14. Homeochronus hereditary optic atrophy, by Geo. M. Gould, of Philadelphia.

15. Electric Therapeutics in Ophthalmic Practice, by Dr. L. A. W. Alleman, of Brooklyn.

16. Gouty and Rheumatic Affections of the Eye, by Dr. W. Oliver Moore, of New York.

17. Some experiences in Hæmorrhagic Glaucoma, its progress and treatment, by Dr. S. D. Risley, of Philadelphia.

18. Suppurative processes of the Vitreous, by Dr. J. F. Fulton, of St. Paul.

19. The local application of Bichloride of Mercury in the deep inflammations of the Eye, by Dr. W. F. Mittendorf, of New York.

20. A clinical study of the visual field in Hemianopia, by Dr. Chas. A. Oliver, of Philadelphia.

21. Glaucoma from traumatic causes, by Dr. E. Lopez, of Havana, Cuba.

22. Skin grafting for malignancy of the Eye Lids, by Dr. E. B. Tiffany, of Kansas City.

23. Spontaneous replacement of a case of detached Retina, by Dr. J. Wallace, of Philadelphia.

24. The Nomenclature of Blepharitis, by Dr. Dudley S. Reynolds, of Louisville.

25. Etiology and early management of Glaucoma, by Dr. G. E. Dean, of Scranton.

26. Acute Monocular Neuro-retinitis with cases, by Dr. B. L. Milliken, of Cleveland.

27. Orbital Tumors, by Dr. W. B. Johnson, of Patterson, N. J.

28. Exophthalmus Traumaticus, by Dr. L. F. Love, of Philadelphia.

29. Further observations on the Eye of the Negro, by Dr. C. W. Kellock, of Charleston.

30. Hæmorrhagic or Croupous Iritis, by Dr. A. Alt, of St. Louis.

31. The hygienic and scientific value of examinations of the Eyes in the schools, by Dr. B. A. Randall of Philadelphia.

THE ELEVENTH INTERNATIONAL MEDICAL CONGRESS.

Regarding the postponement of the meeting, the Executive Committee says: "In consequence of the sanitary condition of several of the European States which prevent their medical men leaving home, the following, the advice of many of the most prominent scientists, both Italian and foreign, the Executive Committee of the Congress has decided by a large majority to postpone the meeting till April, 1894. The exact date of the inauguration will soon be fixed."

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No. 9.

ORIGINAL ARTICLES.

A PERMANENT MAGNET FOR USE IN REMOVING
FOREIGN BODIES IN THE CORNEA.¹

BY WALTER B. JOHNSON, M.D., PATTERSON, N. J.

The magnet is presented as a useful instrument which can be manufactured at a very small cost and is always ready for immediate use.



It is made from a bar of the highest quality steel which is turned down until it is shaped like a cone-pointed cylinder slightly elongated at each end and very highly tempered, six inches in length, one-half inch in diameter, each cone measuring one and one-half inches, and the cylinder three inches.

¹Read at the twenty-ninth annual meeting of the American Ophthalmological Society at New London, Conn.

The instrument is charged by rotating it within the magnetic field of a generator when the molecular charges which occur render it a permanent magnet.

It will continue in full magnetic strength for a long period of time, gaining or losing in a slight degree but always retaining a sufficient magnetic strength for all ordinary purposes.

It could be re-magnetized in a minute or so at any place where a dynamo is in operation.

It has served an excellent purpose on several occasions in removing small particles of steel from the cornea which had perforated and almost entered the anterior chamber, in which efforts at removal with a needle were not safe, endangering the passage of the foreign body into the anterior chamber, and in which passing a Beers' knife through the cornea behind the foreign body, has been advised, before attempting its removal with a needle.

CASES OF LATERAL HETEROPHORIA IN WHICH THE VERTICAL DIPLOPIA TEST PROVED UNTRUSTWORTHY.¹

BY SAMUEL THEOBALD, M.D.,

Ophthalmic and Aural Surgeon to the Johns Hopkins Hospital and to the Baltimore
Eye, Ear and Throat Hospital.

Having, many years since, become convinced that the tests which undertake to determine the strength of the external or internal recti muscles by the amount of lateral diplopia (prismatic effect) which they are capable of overcoming are very frequently misleading, it has been my habit for a long time, in measuring the relative strength of the lateral muscles, to place my chief dependence upon the vertical diplopia test. This test, also, I learned from experience was open to several sources of error; but, I found it practicable to eliminate them, and, in the great majority of cases in which I have employed it, it has proved an entirely trustworthy guide. It has been, therefore, a disappointment to me to find, as I have upon several occasions within the last year or two, that even when all known sources of error are guarded against, this test may prove entirely untrustworthy.

We all, of course, at the present day, appreciate that, in order to obtain satisfactory results with the vertical diplopia test, the refractive condition of the eyes, the presence of anisometropia, and especially at the reading distance, the tension of the accommodation, must be taken into account, and that the test

¹ A paper read before the American Ophthalmological Society, New London, Conn., July 19, 1893.

object employed must be of such a character as to eliminate as far as possible all disposition upon the part of the subject of the examination to blend the two retinal images—a fault which was conspicuous in the test object originally proposed by von Graefe. The several cases which I shall report briefly show, however, that, even when all these precautions have been taken, the test occasionally fails entirely to give us a true index of the condition of the lateral muscles. A description of the cases in point will make my meaning plainer, and to save time, I shall give only such details of each as are necessary for this purpose.

CASE I.—Sister M. N., æt. 40. Hypermetropia of high grade, anisometropia =.75 D., and astigmatism, according to the rule, in each eye of .62 D. At the first visit, without glasses, and with the test object at 20', the cover test gave marked divergent squint of each eye, with slow return of binocular fixation on removal of the cover, occasionally the squint seeming not to disappear until the eyes were turned away from the test object. The vertical diplopia test gave, with the conditions all exactly the same, a variation in the position of the images, indicating at one moment exophoria and at the next esophoria of slight degree. Had the relation of the visual axes been the same with the vertical prism as with the cover test there would have been an exophoria of probably 15° or 20° . Two days later, with + 3. s for the left eye and + 3.25 s for the right (which were prescribed at the time for constant wear) the vertical diplopia test gave no insufficiency at 20', although the cover test gave marked divergence, as at the previous visit without glasses. Six months after this the manifest hypermetropia having increased considerably mean time, with + 4.50 s for the left eye and + 4.75 s for the right (giving $V.=^{20}_{xx}$) there was esophoria at 30', with the vertical prism, varying from 1° to 0° , while with the cover test there was wide divergence of the right eye, and marked, but less wide divergence of the left eye.

At this examination it occurred to me to try the cover test *in combination with the vertical prism* (the refraction being cor-

rected as just mentioned), and, to my surprise, I found not only that the covered eye diverged as usual, but that *on removal of the cover the divergence disappeared, although the vertical diplopia was maintained by the prism, with about the same degree of promptness as when the cover test alone was employed.* In a word, the vertical diplopia seemed to have no controlling influence, whatever, upon the action of the lateral muscles.

CASE II.—Miss L. G., æt. about 15; refraction about emmetropia. Unconfirmed divergent squint of left eye, for which a free tenotomy of left external rectus was done, January 19, 1892, with happy result, the squint being corrected and the asthenopia relieved. Four weeks after the tenotomy a test of the muscular balance gave the following contradictory results: Cover test shows at 20' divergent squint of the left eye most of the time, at 13" divergence which is not always corrected upon removal of cover. Vertical diplopia test (prism before either eye) gives esophoria at 20' varying from $1\frac{1}{2}$ to 0, and at 13" neither esophoria nor exophoria.

CASE III.—Mrs. L. B. T., æt. about 55. Compound myopic astigmatism. With correction as follows: L. eye, — 2. s \ominus — 1.12 c 50; R. eye, — 2.25 s \ominus — 2.25 c 135, giving $V=19^{\circ}$ ALA, the muscular balance was tested with this result:

Cover test gives wide divergence with prompt correction at 20', wide divergence with slow correction at 13"; vertical diplopia test gives no insufficiency at 20', and only 2' of exophoria (less than the normal amount) at 13".

CASE IV.—Miss L. C. N., æt. 15. Compound Ah. of low grade, marked exophoria, asthenopia, headache; free tenotomy of R. external rectus February 20, 1891. March 24, cover test gives divergence at 20' with prompt correction; still wider divergence, especially of right eye, with equally prompt correction, at 13". Vertical diplopia gives exophoria at 20' of variable amount, about 3', and at 13" esophoria at times of 3' and again exophoria of uncertain amount. Seven months later the tests were repeated with the following result, her error of refraction not being corrected: With cover tests, decided divergence (either eye) at 20' and at 13", with deliberate recovery,

with vertical diplopia no insufficiency at 20' or at 13'', dots varying in position at each distance, indicating at one moment slight esophoria and at the next slight exophoria. Had the relations of the optic axes been the same with the prism as with the cover test, a high grade of exophoria would certainly have been shown.

CASE V.—Mr. W. W., æt. about 44. Hypermetropia in left eye, compound Ah., against rule, in right eye, insufficiency of externi. Is wearing for near and far L. eye $+ 2.25$ s \bigcirc prism 3° base out; R. eye $+ 2.25$ s $\bigcirc 1.50$ c 180° . This case presented the same phenomenon described in Case I. the disappearance of a squint produced by the cover test, notwithstanding the presence of induced vertical diplopia. With his correcting glasses the vertical diplopia test showed only 1.2° of esophoria at 20'; with no glasses, it gave at the same distance esophoria varying from 9° to 0° . The cover test, without glasses, gave marked convergence (either eye) with usually prompt recovery, but occasionally the squint would remain for some moments after the cover was removed. When, with the vertical prism in position, the cover test was employed, the excluded eye at once squinted decidedly in, and upon removal of the cover the squint would disappear with about the same promptness as when the cover test alone (without vertical diplopia) was employed.

The foregoing cases do not constitute all those of similar character which I have met with within the past two or three years, for there are doubtless some that I have not been able to recall; but, supposing the total to be twice the number reported, it would still be very small, and quite insignificant when compared with the whole number of cases in which the vertical diplopia test was employed during the period named. While, therefore, disappointed, as I have said, at finding even a few cases in which this test failed me, I continued to employ it daily, and regard it as having great practical value.

I have endeavored to find a satisfactory explanation of the phenomenon I have described, but without success. The first explanation that suggested itself was that, while the two

images of the test object were certainly not fused (in the tests with the vertical prism), possibly the ends of certain vertical lines present in the two retinal pictures, such as the edges of the card upon which the asterisk employed in the near test stands, or the margin of the black board which carries the white disc used in the test at 20', were unconsciously blended; but, this, at most, would have given lateral orthophoria, whereas the vertical prism gave *esophoria* in several of the cases reported, while exophoria of high grade was shown by the cover test.

Again, if we assume the presence of marked anisometropia, and suppose that with the cover test the fixation was with one eye and with the vertical diplopia test with the other, we might account for a marked difference between the results of the two tests; but, this source of error was eliminated, at least in all but one of the cases, by excluding first one eye and then the other in applying the cover test. Complete relaxation of accommodation during the cover test and tension of accommodation with the vertical prism could hardly account for the discrepancies observed, for the same test objects were used in each instance, and every effort made to guard against just such a misadventure as this.

I confess I have not been able to solve the riddle presented by these cases. Will not some member of the Society do it for me?

REPORT OF THE FIRST TWO DAYS' WORK IN THE
SECTION OF OPHTHALMOLOGY OF THE PAN-
AMERICAN MEDICAL CONGRESS, HELD
AT WASHINGTON, D. C., SEPTEMBER
5TH TO 8TH, 1893.

BY ADOLF ALT, M.D.

The President, Dr. J. J. Chisolm, of Baltimore, greeted the members of the Section, and in a few words indicating the work before them called the meeting to order. About thirty five members were present.

Dr. G. M. Gould, of Philadelphia, read a paper entitled, *Homochronous Hereditary Optic Nerve Atrophy*, in which he related the history of thirteen cases of hereditary atrophy of the optic nerve as observed in six generations of one family. The affection came on during adult manhood, usually at from twenty-eight to thirty-four years of age. Some members of the family required a slight traumatism only to induce partial or total blindness, showing a lack of strength of the visual organs. The striking point in these histories is, that after the second generation the disease is only transmitted through unaffected women. Passing the line through a male, although he be blind, stops the appearance of the disease. No woman of the family has been affected. In one group the inheritance passed through three unaffected females. So far as can be learned there are but three young males living who are liable to the disease, that is, who are sons of women of the family when the line has not been passed through a male since the second generation. Of these three brothers the oldest is nearly blind at the age of twenty-eight. His two brothers who have

not yet reached the ominous age have chronic retinitis with degenerative changes already observable. In the later generations there is a remarkable predominance of the male sex, and a rapid decrease of prolific females, thus fortunately bringing the vicious inheritance to a sharp ending. If the law holds good, there will be no danger of a reappearance of the atrophy after this, the sixth, generation, as there will be no male children of the family, whose ancestral line has not been passed through a male of the family.

The paper was illustrated by a carefully worked out diagram.

Dr. S. M. Burnett, of Washington, had had a similar case under observation in which the disease was also transmitted by the females of the family.

The papers announced to be read by Drs. J. F. Fulton, of St. Paul, Ch. A. Oliver, of Philadelphia, and E. Lopez, of Havana, were not read, the authors not being present.

Then followed Dr. G. E. Dean, of Scranton, with a paper on *Etiology and Early Management of Glaucoma*. This author stated that in the line of original thought he had come to the conclusion that glaucoma is due solely to eye-strain due to hypermetropia and hypermetropic astigmatism (former authors, particularly Schoen's book, were evidently not known to him). He thought that glasses, even temporary ones, pilocarpine, salicylate of sodium, acetanilide, applications of a solution of hot boracic acid every few hours would prevent or cure the outbreak of glaucoma. He is satisfied that surgical treatment, particularly iridectomy, will fall into disuse.

Dr. S. S. Koser, of Williamsport, did not agree with the author. He spoke of the uselessness of the so-called early management and medical treatment of glaucoma, and stated it as his opinion that surgical interference alone is useful.

Dr. S. F. McFarland, of Binghamton, has had bad results from iridectomy except in inflammatory glaucoma.

Dr. F. B. Tiffany, of Kansas City, believes with the author, that eye-strain causes glaucoma; as proof of this he considers the fact that in his early practice he saw many cases of glau-

coma, while of late they are rare (due to the correction of eye-strain).

Dr. T. Tyner, of Austin, does not believe in the existence of chronic glaucoma, and knows only the inflammatory form.

Dr. H. Redmond, of Philadelphia, thinks bad results are due to incisions which lie too far in the cornea. Surgical treatment alone is valuable.

Dr. G. M. Gould, of Philadelphia, saw a subacute attack in a case of chronic glaucoma in a neurasthenic female cured by forced nutrition.

Dr. L. T. Love, of Mexico, said that iridectomy is the only remedy in glaucoma.

Dr. A. R. Baker, of Cleveland, asked where the eye-strain could come from when glaucoma develops in a patient seventy-five years of age.

Dr. G. C. Savage, of Nashville, said that even at 120 years of age there might be eye-strain.

Dr. J. J. Chisolm, of Baltimore, stated that by means of eserine and the Japanese hot box he had been enabled to keep many acute cases perfectly under control for many years.

Dr. Tyner asked whether there was no danger of synechia forming, upon which Dr. Chisolm stated that he had never seen a synechia develop.

Dr. T. R. Wolfe, of Glasgow, saw several cases of glaucoma develop in myopia of 5 or 6 D. Although he had found iridectomy frequently disappointing, it is in a large number of the cases the best remedy. He is in favor of paracentesis of the cornea, and values dry heat and eserine highly.

Dr. G. E. Dean, of Scranton, said in conclusion that he condemned only the tendency to rely exclusively on iridectomy. He had not hoped that his *new idea* (?) would be accepted off hand.

Dr. S. D. Risley, of Philadelphia, read a most interesting and carefully elaborated paper on *Hemorrhagic Glaucoma*, in which he related the trist histories of three cases which had come under his own observation. He thought that hamor-

rhagic glaucoma is due to uric acid diathesis and to consequent general arterio-sclerosis and not a local affection.

Internally potassium iodide, or better still small doses of corrosive sublimate, frequently repeated, and long continued, with occasional doses of pilocarpine, were commended as useful in the prodromal stage. Locally eserine in very weak solutions was often beneficial, even before the onset of the glaucomatous stage of the disease, but stronger solutions should be employed in the presence of increased tension.

After the onset of the glaucoma no form of treatment promised much hope of permanent relief except enucleation of the ball. Among operative procedures of a less radical character, posterior sclerotomy to relieve the tension and pain, to be followed in twenty-four hours or later by anterior sclerotomy or in some cases by iridectomy seemed to promise most.

In the discussion Dr. Chisolm related a case of hæmorrhagic glaucoma in which he thought that he had saved one eye by means of eserine. Two years after the attack the hæmorrhage was absorbed, but there was still a chronic glaucomatous condition. Then the other eye was attacked by glaucoma. An iridectomy performed on the first eye saved it, while the second eye was lost.

Dr. T. R. Wolfe, of Glasgow, thought that it was almost useless to do anything in hæmorrhagic glaucoma, but that paracentesis of the sclerotic might help to obviate the necessity of enucleating.

WEDNESDAY, SEPTEMBER 6—10 A. M.

The discussion of Dr. S. D. Risley's paper was continued.

Dr. T. R. Wolfe, of Glasgow, speaks highly of the internal treatment advocated by Dr. Risley and especially dwells on the necessity of examining the urine. He laid special emphasis on the role which emotional influences and mental distress play in the causation of glaucomatous attacks, as shown in Dr. Risley's cases. He deprecated the tendency to explain everything in ophthalmology by refractive errors and said he was

afraid that modern ophthalmology was beginning to degenerate into the mere prescribing of spectacles.

Dr. Hubbell, of Buffalo, stated that the arterio-sclerosis had been proven histologically. Why is it, that hæmorrhagic glaucoma is almost always a mono-lateral affection? The disease is neither glaucoma nor hæmorrhagic retinitis in the common acceptation of these terms. He holds the prognosis to be always bad and prompt enucleation the only treatment. He doubted that the case related by Dr. Chisolm was hæmorrhagic glaucoma.

Dr. S. D. Risley explained Dr. Chisolm's case as one who had passed safely through the first and most dangerous stage of arterio-sclerosis, before glaucoma was developed. In four out of twenty cases collected by him the affection attacked both eyes. He again dwelled on the general arterio-sclerosis as underlying the ocular affection.

Dr. Chisolm related the history of his case again in detail and Dr. Risley then called attention to the fact that the case was simply one of glaucoma with a retinal hæmorrhage and therefore did not prove anything with regard to the question whether hæmorrhagic glaucoma was curable by operation or not.

Dr. J. Wallace, of Philadelphia, read a paper on a case of *Spontaneous Replacement of Detached Retina*.

The origin of the trouble was in a traumatic episcleritis, produced by a small piece of hot brass, which was thrown off from a lathe and struck the right eye in the ciliary region. Date of injury, November, 1888. The inflammation seems to have spread at once to the deeper structures, producing haziness of the vitreous and inflammation of the retina. Five months after the trouble the patient noticed a dark stream, starting from the lower part of the eye and spreading upwards (actually from above downwards). May 1889, O. D. counts fingers, iris greenish discolored, large floating masses in the vitreous of a dark reddish color, no view of fundus. 6-9-89, Fingers only seen in outer field. 7-13-89, No perception of hand, retina can be seen by oblique illumination floating for-

wards, its vessels plainly visible and some red spots near the center. Treatment up to this time, potass. sod. sixty grains per diem. Treatment abandoned. 8-11-89, Patient sees hand when held in lower outer field. The detached retina can now be seen limited to temporal side. 9-8-89, Retina has replaced itself still more. The nasal portion of the retina is now visible by the direct ophthalmoscopic method, and to the temporal side can be seen the hæmorrhages. 12-1-89, V. in lower temporal field $\frac{3}{xxx}$. 1-19-90, V. $\frac{5}{lx}$ direct vision. From this time on V. rapidly increased and field of vision spread suddenly out 3-16-90 with $+ 10 \text{ } \odot + .50 \text{ cy. ax. } 180^{\circ} \frac{3}{xv}$. 7-16-90, $+ 7.50 \text{ } \odot + .75 \text{ cy. ax. } 180^{\circ} \frac{5}{ix}$. This was the best vision obtained and no change has since taken place. The lesion consisted in the rupture of one of the branches of the upper temporal vein of the right eye. The downward gush of blood was visible to the patient as an ascending dark stream. From the source of the hæmorrhage above to the pool of blood below, a coagulation proceeding to partial organization took place. The subsequent contraction of the clot pulled the retina from the choroid. The co-existing disease of the vitreous rendered this all the more easy. On the first view of the fundus after replacement of the retina, a structure like the strings of a harp was seen to extend from the lower clot. Some of these had snapped in the middle and some had parted at their upper or lower extremities. The mechanism of the detachment is thus easily shown. A small detachment still remains above and below. In the vicinity of the macula is seen a white crescentic line caused by the stretched and distorted retina. A curious metamorphopsia of a straight line appearing curved to the patient corresponds exactly with this defect, and the curve as drawn by him is exactly the shape of the retinal lesion.

The case was illustrated by a large painting of the fundus.

After this paper the subject of the day, *Refraction*, was taken up. The discussion of this subject was deferred until all the papers bearing on it had been read.

Dr. E. O. Belt, of Washington, read a paper on *A Compari-*

son of the Eyes of White with Those of Colored Pupils in the Public Schools of Washington.

The fact of the increase of myopia during school life being established, the important point for the physician to consider as its cause and its prevention.

That heredity and older civilization have much to do with it, would seem to be indicated from comparisons made between pupils in Europe and in this country, and it was thought a comparison between the eyes of white and colored pupils would throw additional light upon this point.

The few cases of abnormal eyes found among the colored pupils, as compared with the white, indicate the influence of heredity, and the more advanced civilization in the causation of defective eyes. Especially is this so of astigmatism, which was found in twenty-five per cent. of the white and in only ten per cent. of the colored pupils. That hypermetropic eyes are unhealthy ones, and tend to become myopic after passing through the stage of emmetropia, seems also to be indicated.

Dr. C. A. Wood, of Chicago, read a paper *On Further Studies of the Cycloplegic Value of Homatropine and Cocaine Discs, as Atropine, Duboisine and Hyoscine Substitutes.*

The results of these investigations (which now number several hundred) are chiefly these:

1. All the cycloplegics fail upon occasions to paralyze the accommodation, and this fact must always be kept uppermost in comparing their merits as cycloplegics. I have numerous cases on my note books where a one per cent. solution of atropine, instilled six times in forty-eight hours revealed (*e. g.*) a much higher degree of hyperopia or astigmatism a couple of weeks after a first trial. In comparing homatropine *plus* cocaine disks, as I have chiefly done in my later investigations, with atropine sulphate (1 per cent solution) and hyoscine hydrobromate (single instillations of a one per cent. solution, examination an hour afterward) I have begun sometimes with one agent, sometimes with the other, so that the assistance obtained by the previous use of another cycloplegic might not only assist the one under observation.

2. Hyoscine hydrobromate, as well as its near relative duboisine sulphate and hyoscyamine sulphate appear, in my hands at least, to be too toxic, too uncertain, and even too dangerous to be used by the patient as atropine can be, and in none of the cases where I have employed all three agents were better results obtained than with atropine—*quoad* the ciliary paresis. Even with the patient under observation in my office or under my assistant's care in the hospital, they all impressed me—take what precautions I would—as dangerous and unreliable agents. Small doses of them are inefficient, and and large doses may prove toxic. In many instances one is reduced to the choice between poisoning one's patient and not relaxing his accommodative spasm.

3. With the foregoing modification, I found little or no difference between the cycloplegic effects of the four named alkaloidal salts and disks of gelatine containing the one-fiftieth grain each of homatropine (alkaloid, Merck) and cocaine (alkaloid, Merck).

4. I used, however, in young subjects, and in cases of suspected accommodative spasm, one disk of the latter every twenty minutes until three had been put into each eye, and made the examination between 80 and 110 minutes after introducing the first disk.

5. That the personal equation should not disturb the accuracy of the observations, every case was first worked out by the retinoscopy method, and under similar conditions, by my painstaking assistant, Dr. T. A. Woodruff, and afterward reviewed by myself. The retinoscopy result was accepted as the refractive condition, and no reliance was placed upon the patient's statements.

6. Tables giving the result in every case form part of this paper, and are in line with the statements just made.

Dr. G. C. Savage, of Nashville, read a paper *On the Necessity for Complete Suspension of Accommodation by Mydriatics in the Adjustment of Glasses*. In this able paper the author maintained that no glass should be prescribed without full paraly-

sis of the accommodation by means of atropia, no matter what the refractive error.

Dr. E. Jackson, of Philadelphia, followed with a paper *On Astigmatism Following Cataract Extractions and Other Sections of the Cornea*. He stated that As was never wanting after cataract extraction and he had seen as high as 15D. A year after the operation As is usually reduced to 4D, and often to less than 3D. It is therefore a wise rule in prescribing cataract glasses to correct only 3D or less of As. A year and a half after the operation the degree of As is usually stationary. The influence of prolapse of the iris on the degree of As is small in comparison to the amount of iris-tissue lying in the wound. The As is due to the interruption of the continuity of the elastic membranes of the eye. The author found that it is well to give the concave cylinder and to have it ground on the back of the plano-convex lens correcting the aphakia, thus producing a periscopic effect.

Dr. L. J. Lautenbach, of Philadelphia, spoke on *A Few Thoughts About Ophthalmometry, as to what the Javal Instrument Will Do and What it Will Not*.

The author stated that nothing but the corneal As could be measured by means of the ophthalmometer, and especially turned against all extravagant claims that have been made by too enthusiastic admirers. The ophthalmometer is a valuable aid in diagnosis—nothing more. The author detailed further on, how changes in the corneal curvature may give hints with regard to internal eye diseases, particularly of coming attacks of glaucoma, or of other inflammatory changes.

The other papers announced in the program for this day were not read on account of the absence of their authors.

The remainder of the day was given over to the discussion of the papers read and the general subject of diagnosis and correction of errors of refraction. No new points were brought forward and a great deal of the discussion consisted of relating of personal experiences. While some insist on the necessity of using atropine in every case of error of refraction, no matter at what age, others consider it necessary in all cases under

forty-five years of age, others only in children and in cases of esophoria. Some are absolutely satisfied with cocaine and homatropine either in solution or in the shape of Wood's discs. Some maintain that full correction is absolutely necessary, others did not. Skiaskopy and Javal's ophthalmometer had their ardent friends as well as adversaries.

As sickness prevented my attending the session of the following two days, Dr. A. R. Baker kindly consented to give the gist of the discussion after the papers relating to heterophoria had been read.

DISCUSSION FOLLOWING THE READING OF PAPERS ON HETEROPHORIA (THIRD DAY).

BY DR. A. R. BAKER, OF CLEVELAND.

Dr. Geo. L. Stevens, of New York, opened the discussion on muscular errors by stating that when a patient entered his office he immediately recognized the character of his heterophoria by the facial expression. He stated that the ophthalmic surgeon who treated muscular errors by operative measures like the mountain climber was constantly seeing what seemed to be the top of the mountain but was misled many times and must expect to be mistaken in the results attained, but like ascending the mountain, if followed long enough and persistently enough, success would be sure to follow; be the mountain ever so high.

He stated that muscular errors could best be detected and treated without correcting the error of refraction.

This is contrary to his former teaching. He does not believe in the interdependence of convergence and accommodation as generally taught.

He strongly criticised all the methods of tenotomy as described in text-books and detailed at length the operation for partial tenotomy as practiced by himself. He also described an operation of the recti muscles.

Dr. Swan M. Burnett, of Washington, stated that he had become an ardent advocate of partial tenotomy in selected cases of heterophoria. That in a few cases of asthenopia, where spectacles, prisms, muscular exercises, general tonics, in short, everything had failed, he had secured the most brilliant results from the operation, and believed that the profession were un-

der lasting obligations to Dr. Stevens for what he had done in this direction.

Dr. S. D. Risley, of Philadelphia, cautioned the younger members of the Society as to care in selecting cases for operation, and cited several instances in which great harm had resulted from the improper selection of cases. One case was particularly interesting of commencing tabes. Another case which had been under the care of several skillful oculists, and in which muscular exercise, prisms, tenotomy and general tonics had failed to give relief, was permanently cured by the insertion of a pessary. He believed that many of the obstinate cases were caused by a uric acid diathesis and could be cured only by appropriate treatment directed to removal of this cause. On the other hand he had found many of these patients most grateful for relief afforded.

Dr. G. C. Savage, of Nashville, said that he was an enthusiastic admirer of Dr. Stevens and his work. He differed with him however in the statement that refraction errors should not be corrected before testing for muscular errors.

He discussed at length the etiology of heterophoria and showed very conclusively why a few cases of simple hypermetropic astigmatism of low degree with exophoria could wear minus cylinders with more comfort than plus ones.

The Chairman, Dr. Julian Chisolm, of Baltimore, said that the discussion of muscular errors was of even more importance than that of errors of refraction; personally he had seen the most happy results from graduated tenotomies as recommended by Dr. Stevens, and believed it a subject worthy of our most serious and thoughtful study.

Dr. Geo. M. Gould, of Philadelphia, said he believed that tenotomies, graduated or otherwise, for the relief of muscular insufficiencies would not be made in ten years from now, and he thought that some of the gentlemen present would have occasion to regret the numerous tenotomies they were making, as he had already had occasion to regret some of his earlier operations.

He characterized the operation for muscular insufficiency as

unnecessary, unscientific, fraught with danger and unworthy our specialty. He believed we were following in the footsteps of the gynecologists who have brought their specialty into disrespect in the minds of all right thinking physicians.

He believed much, if not all, the present literature on this subject would be consigned to the dust bin by the medical historian of the future. Dr. Gould also described the method he pursued to strengthen the ocular muscles.

Dr. A. R. Baker, of Cleveland, thought that Dr. Gould would have little occasion to regret his strong condemnation of the promiscuous snipping and cutting of the tendons of the ocular muscles now indulged in by certain ophthalmic surgeons. He said that for many years we have been striving to so perfect our means of correcting errors of refraction as to be able to cure cases of strabismus without resorting to tenotomy. And now that we had about succeeded in curing most of these cases without operative interference in which there is a positive rational indication for operation, these fellows come along and tell us that we must operate in every case where there is the slightest deviation.

He believed division of the tendons in most cases to be unnecessary, and he thought partial tenotomies unscientific and unsuccessful, that a partial tenotomy eventually shortened instead of elongated the tendon, and that when a tenotomy was performed a complete division of the muscle should be made and controlled by a suture if necessary.

SOCIETY PROCEEDINGS.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

HENRY POWER, M.B., F.R.C.S., President, in the Chair.

FRIDAY, JULY 7, 1893.

EPITHELIAL PEARL TUMOR IN THE IRIS, FOLLOWING IMPLANTATION OF EYELASH IN THE ANTERIOR CHAMBER.

This paper, by F. Richardson Cross and E. Treacher Collins, was read by the latter. J. C., aged 8, presented for loss of sight in the right eye, seven months after the eye had been wounded with a piece of wire. On examination, the eye was free from inflammation, tension normal, traumatic capsular cataract, with posterior synechiae. At the upper inner segment of the anterior chamber was a small nodule, from which an eyelash passed downwards in front of the iris. An operation was undertaken to remove the eyelash, and if possible the small nodule, which was diagnosed to be an epithelial implantation cyst growing from the root sheath of the cilium. The eyelash was readily removed, but the cyst was closely adherent to the iris, which was in its turn so fixed by adhesions, that it could not be extracted, but came away piecemeal in the forceps. The wound healed well. Two months afterwards the tumor had commenced to grow again. The patient then disappeared for nearly a year, after which he returned with great

irritability, lachrymation, and photophobia of the right eye. The tumor had much increased in size, and as the left eye was sympathetically irritated, and the former operation had been so difficult, the eye was enucleated, and sent to Mr. Treacher Collins, who reported the tumor to be surrounded by pigmented iris tissue, and free of cornea, vitreous and ciliary body. The mass situated in the iris was a cyst with opaque white contents lined by laminated epithelium, the cells in contact with the iris tissue the best developed, the innermost ones being flat and scaly; the contents of the cavity consisted of fat globules and polyhedral cells in which no nucleus was stained. They were probably epithelial cells undergoing degeneration. The pupillary border of the iris was united by newly formed fibrous tissue to the anterior capsule of the lens. Seven analogous cases were quoted as showing that the histology of the tumors was similar to this, and that all had resulted from a long residence of an eyelash in the anterior chamber. In contradistinction the successful result of early removal of eyelashes from the anterior chamber was mentioned, and the immediate diagnosis of such a condition and its prompt treatment insisted on.

Dr. Rockliffe (Hull) referred to a case he had reported to the Society (*Oph. Soc. Trans.*, 1883), in which a cystic growth in the anterior chamber followed the implantation of an eyelash. Since that date he had had another case under care in which one eyelash, perhaps two, had been carried into the anterior chamber through a corneal wound by a piece of wire.

Dr. Ernest Clarke had reported a case two years ago. He had been able to remove the eyelash.

Mr. Snell (Sheffield) referred to a case now under his observation. He had operated on the patient for cataract fourteen years ago; there was now a cyst in the anterior chamber, which he thought might be of the same nature as that described by the previous speakers.

THE DIAGNOSIS AND PROGNOSIS OF PATHOLOGICAL MYOPIA.

Dr. Rayner D. Batten read this paper, and after reference to a former paper, in which he maintained that myopia was frequently the result of constitutional disease (*Oph. Rev.*, January, 1892), he said that the object of the present communication was to show that a diagnosis of the constitutional cause of myopia might be made from the condition of the fundus. Physiological myopia should be confined to a simply refractive condition, in which there was no fundus change of any kind. Pathological myopia was not necessarily a refractive condition, and might even be associated with emmetropia or hypermetropia, and was characterized by the formation of crescents, the stretching and distortion of the vessels, the presence of staphylomata, local and general disturbance of pigment. At present physiological myopia was not distinguished from pathological myopia in its early stages, but only when the latter was far advanced. Pathological myopia might be acute, chronic-progressive, or stationary. The acute might end in arrest, or become chronic, and might be the result of various constitutional diseases. In the chronic form a diagnosis might be made between myopia due to cardio-vascular conditions, struma and inherited syphilis, and unhealthy occupations. Pigmentary changes are associated with myopia, marked pigment change at the margin of the crescent was a sign of acute myopia, and in the chronic form a distinction was made between a thin choroid, rendering the choroidal vessels visible and occasionally associated with a very fine dust-like retinal pigment change, and a choroid in which the pigment appeared divided into islands; the former was attributable to cardio-vascular conditions; the latter, to strumous or specific disease. Staphylomata, four classes: (1) That in which the staphyloma was in the macular region; (2) that in which it occurred on the nasal side; (3) that in which the optic disc formed the deepest part of the staphyloma; and (4) that in which it took place towards the periphery. In all cases except the first the refractive condition at the optical axis was

no measure of the extent of the myopia. Peripheral myopia was a cause of astigmatism, by causing distortion of the lens and cornea. Distortion of the vessels, three forms: (1) When the vessels were drawn from their normal course in relation to the optic disc; (2) when they appeared stretched and straightened; (3) when they emerged by separate branches from the optic disc. The direction of the distortion of the vessels depended on the position of the staphyloma. This was particularly marked in cases of nasal staphyloma, the vessels being drawn to the nasal side of the optic disc, and the macular branches having to bend back in order to supply that region. Distortion of the vessels was one of the early signs of commencing myopia. The direction of the distortion pointed to the position of the staphyloma, and the degree of the distortion or stretching of the vessels was an important factor in the prognosis. Central (physiological) cupping of the optic discs, was a form of the staphyloma, and an early manifestation of commencing myopia, and responsible for the exit of the vessels from the optic disc in numerous branches, the main trunk of the vessels having been drawn into the staphyloma. The early premonitory signs of myopia were central cupping, distortion of the vessels, commencing crescents, and astigmatism.

RECURRENT THIRD NERVE PALSY ASSOCIATED WITH MIGRAINE.

Mr. Snell (Sheffield) related two cases; one was in a young man, aged 27. Migraine had existed since the age of 10, but only for the last seven years had the eye been closed with the attacks. The attacks, at first at intervals of about eight weeks, now recurred every two or three weeks; they lasted three or four days. The palsy of the third nerve was practically complete; ptosis and paralysis of the ocular muscles including dilated pupil and palsy of accommodation. The attacks commenced with vomiting and headache. The ocular palsy in the interval did not completely pass off, and the latest accounts, two years after he had last been seen, indicated that the drooping of the lid was becoming more permanent.

The second case was in a girl, aged 18. She had two attacks at intervals of four years, though migraine outbreaks continued in the interval. Each time she had made a perfect recovery, though the third nerve was not, at the worst, as completely involved as in the first case. Recovery was much longer in taking place. Mr. Snell gave additional particulars of a similar case he had brought to the notice of the Society some years ago. He remarked that the shorter the interval the more rapid appeared the recovery in these cases, and also that the affection was always monocular, and showed no disposition to affect the other eye.

LIVING AND CARD SPECIMENS.

Mr. Work Dodd—Pemphigus of Conjunctiva.

Mr. Holmes Spicer—Ectopia Pupillæ.

Dr. Batten—Pigmentary Moles in Retina.

Mr. MacKinlay—Hyperostosis of Skull.

Mr. Lawford—Microscopic Sections of Sarcoma of Conjunctiva.

Mr. Adams Frost—1. Retinitis Proliferans. 2. Papillary Growth of Cornea.

ELECTION OF OFFICERS.

At the conclusion of the meeting the annual general meeting of the Society was held for the election of officers for the ensuing session, and to receive the report of the Council. The following officers were elected:

President—D. Argyll Robertson, M.D.

Vice Presidents—Edgar A. Browne (Liverpool), George Lawson, Stephen Mackenzie, M.D., William M. Ord, M.D., D. C. Lloyd Owen (Birmingham), Henry Power, Simon Snell (Sheffield), John Tweedy.

Treasurer—George Cowell.

Secretaries—Charles E. Beevor, M.D.; Gustavus Hartridge.

Librarian—W. Adams Frost.

Other Members of Council—Ernest Clarke, M.D.; F. Richardson Cross (Bristol); J. Mackenzie Davidson, M.B. (Aberdeen); Robert W. Doyne (Oxford); A. Hill Griffith, M.D. (Manchester), J. R. Lunn; Joseph Nelson, M.D.; J. A. Ormerod, M.D.; W. C. Radcliffe, M.D. (Hull); A. E. Sansom, M.D.; G. H. Savage, M.D.; A. Quarry Silcock.

After the customary vote of thanks to the retiring officers, the Society adjourned till October.

SELECTIONS.

REMARKS ON ACUTE INFLAMMATION, ACCOMPANIED BY GREAT PAIN IN THE HEAD AND EYES, AND BLEPHAROSPASM, OCCURRING SOME HOURS AFTER WITNESSING ELECTRIC WELDING OPERATIONS. ITS PREVENTION AND TREATMENT.¹

BY H. FENDELACK HEWETSON, M.E.C.S., F.L.S.,

Hon. Surgeon Eye and Ear Departments Leeds General Infirmary, President Elect
Otolological Section British Medical Association, 1893.

In view of the advancing utility of electric appliances in the working of iron for various purposes, and having last March opportunities which had never occurred to me before in my experience for seeing no fewer than five cases affected in the eyes by the glare of electric welding of iron, I propose to give a short history of those cases, and to draw attention to the need of extreme care in exposing, or rather protecting, the eyes by scientifically-constructed glasses or shields when in the presence of such a dangerous light.

The principle of this system of welding, known as the Bernardo system, it may be as well to state, in passing, consists in the concentration of a great degree of heat upon a small area by means of an electric arc between the metal to be welded

¹Delivered at a meeting of the Yorkshire Branch of the British Medical Association, held at Sheffield.

and a movable carbon rod conveying the current. It is well known that the temperature of the electric arc is the highest that can be produced artificially, exceeding that of any furnace. A piece of steel can thus be brought to welding heat, or made to run like solder.

The other system is named the Thomson-Houston system, and consists of merely causing a current of electricity to flow through two portions of the metal which are to be united, and owing to the high resistance of the imperfect junction the joint is raised to a welding temperature.

I shall here take the opportunity of thanking Mr. J. Scott Anderson, of Sheffield, for the above description of the methods of electric welding and many other useful hints of its future capabilities, which seem to cover a very wide area of applicability reached on the one extreme by repairing of flaws in a 20-ton shaft, and in the other a silver cream jug or a gold sleeve link.

On March 15 last I was hastily summoned at midnight by the celebrated engineer, Mr. Sampson Fox, to see a party of experts in electric engineering staying with him in Leeds, and who had earlier in the day been engaged for two and a-half hours in conducting experiments on a large scale at some important works at Birmingham. The first patient whom I was particularly asked to see was a German engineer, aged 50. I found him in bed suffering evidently very severe pain indeed, in the head and eyes. He was entirely unable to open his eyes, the blepharospasm being so severe. But I was able to force open the lids and examine the eyes externally. I found the conjunctiva injected and the pupils contracted and apparently fixed. This had been going on for three hours. Cold applications which he was using did not appear to relieve him in the least. Accordingly I dropped a ten per cent. solution of cocaine into the eye freely and ordered him to apply alum lotion, three grains to the ounce of rose water frequently, repeating the cocaine drops at intervals of an hour if he remained awake. This treatment gradually relieved the acuteness of the symptoms, and in about three hours he fell asleep, sleep-

ing for five or six hours. The most remarkable point is that when he was able to open the eyes, the pain had gone, the injection of conjunctiva was much reduced, and he had absolutely no photophobia. His vision two hours afterwards, when I tested him, was perfect; the pupils and tension were normal. The ophthalmoscope revealed no abnormality of the fundus whatever. The second patient was Herr Krupp's manager, the great gun manufacturer, to whom I am greatly indebted for much scientific information upon this important and interesting subject. He also had witnessed the experiments earlier in the day in Birmingham, and observed that the workmen who were immediately engaged in the electric welding wore goggles, the composition and construction of which I shall refer to later on. The engineers had goggles also for their use, but minus the side protectors with which the workmen's glasses were provided. He also told me that five separate weldings of iron were proceeding at the same time in different directions, and that he felt the light pass by his glasses at an angle from a welding which he was not noticing, on account of the absence of the side protectors. I found that he had not suffered so acutely as the first case. Some photophobia had developed earlier in the evening and passed off. There was conjunctival redness and a tendency to contraction of the pupils, but the vision was unaffected. In the morning he was perfectly well without treatment, and I could observe no retinal changes. The third attack occurred in the case of an engineer from Cologne, aged 40. The symptoms in his case were subacute, between the first two in severity. He, too, almost recovered untreated by morning, and the vision and ophthalmoscopic appearances gave negative results, some conjunctival injection only remaining.

Forming part of this assembly of engineers were two from Glasgow, both of whom on a former occasion had suffered very acute symptoms from witnessing electric welding, although apparently well protected by specially constructed goggles but unprovided with side pieces. These gentlemen compared their symptoms to those of their German *confrères*, and they

also got well rapidly under the free use of cocaine drops and cold applications—I believe suggested by Dr. Cluck, of Greenock. I must confess that I had never either seen or read of symptoms of this acute nature caused by electric welding such as the worst case presented, and their occurrence, in the face of their possibilities of electrical advance, which is taking place by leaps and bounds, uponed up whole fields of thought.

It is customary for the workmen in Sheffield, where the electrical welding of iron plates is carried out, to hold shields—which I shall specially describe—in the left hand, so that no direct electric light can possibly strike the eye. These shield-glasses, both in England and Germany, are constructed upon the conviction that it is the chemical rays which are so active in those special processes. The glass is therefore composed in German works of the deepest blue superimposed on red—the combination arranged in tone and tint to compose violet under the impact of this intense light, in fact to cut off the rays, which are known to be nearest the region of the most actively chemical rays of the spectrum of white light. This combination, I am informed, is so dark—or ought to be—that daylight can barely penetrate the glass, still the glare of the electric welding does so sufficiently for the workmen to see what they are doing. None of the workmen are reported to have suffered at all on this occasion, and probably none of the party would have done so had they had side pieces to their goggles.

In conversation with Mr. Scott Anderson's electrical engineer, I elicited some very interesting and valuable hints in regard to protecting the eyes during electrical welding operations. After a large number of experiments, he finds that the best protector is in the form of a wooden shield about 12 inches by 10 with a short handle. Into the center of this shield a series of five sheets of ruby glass are let into a rectangular opening about 5 inches by 3 1-2 set horizontally. This combination of five sheets of ruby glass he finds to be necessary, as sufficient density is not obtained by one plate glass of thickness equal to the five. The test to prove if the shield is

perfect is to hold a lighted candle in front of the shield in an otherwise dark room; and if, through the ruby glass, the flame is reduced to the appearance of a spark, such as is seen in a recently blown out candle, sufficient protection is obtained. This form has been found by experiment to be the best—better than any form of goggles or glasses—to be worn; and he tells me that my patients would never have been attacked had they been provided with such shields instead of the glasses which they wore. There is, further, an additional reason in recommending the use of the shield—the workman can hold it in the left hand, and with the right he directs the carbon rod; the shield protects the skin of the face and neck, which becomes tanned and peels off, just as the skin does when exposed to the rays of the sun—not from any heat, however, which is radiated, but evidently from the chemical rays. The Sheffield engineers do not think that the violet combination which the Germans recommend is so good as the compound ruby glasses in the shield. There are many points of interest which arise in these cases in the endeavor to explain the symptoms which I have recorded.

Probably the action is analogous in a minor degree to those instances in which the retina has been either temporarily or permanently damaged by the glare from a flash of lightning. If such severe symptoms may be caused by the chance striking of a small amount of such light, comparatively, into the periphery of the retina, how much more disastrous and acute the symptoms must necessarily be if by some accident the glasses or shields were broken or removed, and thereby exposing the eyes to the fierce glare unguarded. I am told by the engineer such is the convenience of this form of welding that it must rapidly come into constant use, especially where the electric light is already laid on, since this form of electric transmission can be readily utilized at a comparatively small cost. It is evident that with sufficient protection, such as I have described, no harm is found to occur, and I daresay that the eye may to a certain extent become tolerant of this light. It is the first occasion on which I have observed an eye disorder.

der to be induced by electric welding or electric lighting of any kind. Other observers think that they are able to trace some forms of asthenopia and photophobia to this cause. But this is an extension of the subject which is outside the object of this special paper, and it is not my present intention to pursue it further than to notice this fact, observed by others, as being widely interesting when taken in connection with the more general question of electric illumination.—*British Medical Journal*.

OPHTHALMOLOGY.

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ORIGINAL ARTICLES.

RETROPHARYNGEAL ABSCESS IN AN INFANT, FOLLOWED BY PARALYSIS OF THE OCULAR BRANCHES OF THE SYMPATHETIC NERVE OF ONE SIDE.

BY A. SCHAPRINGER, M.D., NEW YORK.

Annie A., nine months old, was brought to me by her mother September 16, 1893, on account of a peculiar condition of her right eye. Whilst the left eye appeared normal in every respect, the palpebral fissure of the right eye showed only half the width of that of the other. The pupil of the right eye was also smaller, its diameter being about one half of that of the other eye. The outlines of the miotic pupil were regular, the vertical diameter being a trifle larger than the horizontal.

These were the only abnormalities that could be made out. Both pupils responded to the action of light. There was no impairment in the mobility of either globe. The right upper lid, though permanently lower than the left, was raised when the child looked upwards. There was no sinking back or enophthalmus of the affected eye. The mother stated that she had covered the well eye and convinced herself that the baby

could see with the right eye. No satisfactory ophthalmoscopic examination could be made on account of the restlessness of the baby who, in every other respect, seemed quite well.

Three months ago when the child was six months old, it was attacked by a retropharyngeal abscess which had to be repeatedly incised from the mouth. The physician who had the child in charge had a suspicion that the abscess was due to disease of the cervical vertebræ. The little patient was very low at that time and was not expected to live. Its rapid recovery was looked upon as almost marvelous. This quick recovery speaks against the presumption that there was disease of the bone at the bottom of the abscess.

No definite statement can be had of the mother who belongs to the least intelligent classes of the community as to the exact time when the eye symptoms made their appearance, but it seems highly probable that the incisions made had nothing to do with the production of these symptoms, and that the latter were the consequence of the morbid process itself.

There is no difference in the color of the two sides of the face or of the ears, nor is there in the temperature of these parts as far as can be made out by palpation. There is no swelling of the submaxillary or cervical glands to be felt at present.

The child was seen only once as the mother failed to return.

As far as I know the literature of the subject, this is the first case on record where paralytic symptoms of the ocular branches of the sympathetic nerve were noticed after recovery from a retropharyngeal abscess. The two symptoms observed here, the ptosis and the miosis, were evidently due to paralysis of the *palpebralis* and *dilatator pupillæ* muscles, both innervated by branches originating from the cervical sympathetic nerve.

Those who are interested in the subject of the relation between the cervical sympathetic nerve and the eye will do well to look up the exhaustive papers of Möbius (*Zur Pathologie des Halssympathikus. Berliner Klin. Wochenschr.*, 1884), and Theodor Beer (*Studien ueber den traumatischen Enophthalmus.*

Knapp and Schweiger's *Archiv. f. Augenheilk.*, xxv, Bd. 1892, German Edition). Both of these papers contain ample references to the literature of the subject.

The case will in all probability make the rounds of the special dispensaries of this city. My object in publishing the incomplete notes I have taken is to draw special attention to it. It will be interesting in many respects to observe further developments. In a large number of similar cases abnormalities of the sensibility of the skin of the affected side have been observed. It will, of course, be very difficult to test for anything of this kind in so young a child. Other objects to be kept sight of are the blood supply, color, and state of nutrition of the right side of the face and neck as compared with the other, also the function of the sweat glands, and the pulse-rate.

As observed before, there was no sinking back of the globe or enophthalmus when I saw the patient. As Moebius pointed out, this symptom of paralysis of the cervical sympathetic nerve is apt to develop only later in the course of time. The reason for this tardiness is not given by Moebius. I venture to give the following explanation for it.

In the case here reported there was ptosis on the right side. This ptosis was not caused by paralysis of the respective branch of the oculomotor nerve which supplies the *levator palpebrae superioris* muscle, but by paralysis of the unstriped *palpebralis* muscle which has been discovered by Heinrich Müller, and which is innervated by the sympathetic nerve. The same twig which supplies this muscle also innervates the *orbitalis* muscle. Irritation of the latter causes protrusion, and paralysis the opposite condition which is called enophthalmus. The position of the globe within the orbit depends upon the sympathetic nerve in two different ways. First, because the function of the *orbitalis* muscle is regulated by this nerve in the way we have just detailed. Second, the position of the eyeball depends, also, upon the amount of blood contained in the vessels of the orbital cavity, and this amount of course upon the calibre of these vessels, which calibre again depends upon the state of innervation of the muscular fibres in their coats.

These fibres are innervated by a branch of the sympathetic nerve. Paralysis of this branch will cause an increased amount of blood to be contained in the post-ocular vessels and consequently a protrusion of the globe. Paralysis of the branch innervating the *orbitalis* muscle has the opposite effect, as we said just before. In the case of the child under discussion we may safely assume that both these branches are paralyzed and that effects of this paralysis neutralize each other for the time being. Paralysis of branches of the sympathetic nerve also causes nutritive changes. These, of course, cannot show themselves immediately, but take time to develop. Whenever they will have had time to develop in our patient, enophthalmus will be observed as a result of atrophy of the orbital tissue combined with paralysis of the *orbitalis* muscle. (Compare: E. Heese, Ueber den Einfluss des Sympathicus auf das Auge, etc. *Pflueger's Archiv f. Physiol.*, Bd. LII.).

The tension and the size of the eyeball are further points of which notes should be taken. Nicati (*La paralysie du nerf sympathique*. Lausanne, 1873. Quoted by Moebius), and Moebius observed that in the course of time the size of the globe shrank in cases of paralysis of cervical sympathetic nerve.

Postscript.—At the time I was engaged reading the proof of the foregoing, I met mother and child again. The mother reported that the child when warm and perspiring, did not show any perspiration in the left side of her face which also felt cool at such times as compared with the other side. The skin of the lids of the right eye is slightly reddened. This, the mother says, is caused by the baby rubbing this eye very frequently on account of the presence of an increased amount of secretion oozing from between the lids.

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ON CROUPOUS OR HÆMORRHAGIC IRITIS.¹

BY ADOLF ALT, M.D., ST. LOUIS.

Iritis is a disease of such importance that every text-book on ophthalmology must needs devote considerable space to its description and in most text-books there is quite an important and lengthy chapter which goes minutely into details of the clinical and pathological features of so frequent and important an affection. It is, in consequence, doubly strange, that one form of iritis which constitutes a well marked type, is to this day in most text-books not mentioned at all and receives in but a few a very scanty notice. I mean, what has formerly been called *iritis gelatinosa*, or *spongiosa* (spongy iritis [Knapp]), what years ago after a histological examination I termed *hæmorrhagic iritis* and what, I now think should be called "*croupous iritis*."

The literature concerning this form of iritis began with the description of two cases by Schmidt (*Klin. Monatsblätter f. Augenheilkunde*) in 1871. This was followed by papers by Gunning (*Klin. Monatsbl.*) in 1872, a case by Gruening and one by Kipp (*Knapp's Archives*, Vol. III) in 1873, five cases by Knapp (*his Archives*, Vol. VI), one case by myself with histological examination (*Knapp's Archives*, Vol. VI), two cases of iridochoroiditis of the same nature by Knapp (*Archives*, Vol. VII), and one case by Swan M. Burnett in 1880 (*American Journal of Medical Sciences*). This, with the exception of a casual remark here and there, is all that I can find in the literature at my disposal concerning the disease under consideration.

The number of cases here mentioned in literature does, of

¹Prepared for the Pan-American Medical Congress at Washington.

course, in no way compare to the number of cases observed—and the disease is not as rare as one might suspect from the fact that its existence is almost totally ignored in the text-books. I myself have notes of some thirty cases and Knapp stated in Volume VI of his *Archives* that he had notes of about eighteen cases, which number has surely been considerably increased since then.

Pathological distinction between the different forms of iritis is usually made according to the product of the inflammation and we have three types generally adopted and described, namely, the serous, the plastic and the purulent iritis. We all know that these forms often are mingled with each other, still typical cases of each kind are seen often enough to enable us to clearly distinguish them.

To these well recognized types must be added as the fourth type, that of croupous iritis, the characteristic exudation being in no way distinguishable from the croupous exudation elsewhere. Clinically this exudation is first seen as a grayish, grayish-yellow or grayish-green semi-transparent substance (showing sometimes stripes and dots), which, when the patient is seen, usually fills the anterior chamber to its full extent. After having remained apparently much the same for a period varying from a day to a week and even much more, during which time hæmorrhages into the anterior chamber not infrequently take place, the exudation becomes transparent in its periphery, is liquified and gradually absorbed. This change is visible usually at first in the upper part of the anterior chamber where a small strip of iris tissue becomes uncovered the exudation sinking according to the law of gravitation. The exudation then shows a sharp, sometimes perfectly round, sometimes jagged edge upward, and has at this stage an appearance which very much resembles a cataractous crystalline lens dislocated into the anterior chamber. This likeness is the more striking as the anterior chamber usually is very deep. Gradually the melting process and the absorption of the material go on. Later a small piece only is seen lying at the bottom of the anterior chamber and finally this, too, disappears.

When the exudation has perfectly gone, the eye is generally in the same condition as one recovering from a plastic iritis.

Such a croupous iritis may be seen to run its course totally uncomplicated, and to heal without or with the formation of synechiæ, or it may be seen to develop as a separate feature during a plastic or gummatous iritis, or it may be accompanied from the outset by a purulent iritis. It may come on spontaneously or, what is more frequent, after an injury or operation.

That the disease in its typical form may spread also to the ciliary body and choroid seems proven by the cases clinically observed by Knapp. That it may also constitute part of a deleterious iridochoroiditis, which clinically is usually recognized as a purulent one only, I have shown in a recent paper, published in the *AMERICAN JOURNAL OF OPHTHALMOLOGY*. (See Vol. X, No. 5, page 136).

Let me here introduce the short histories of a few typical cases.

B. F. S., came to consult me on account of an injury due to a piece of steel striking his right eye. Another physician had worked for two hours on the previous evening to remove the piece and finally declared that he had succeeded. The patient having passed a night of excruciating pain, came to see me the next morning. There was a great deal of swelling, photophobia and lachrymation. After cocainization I found considerable circum-corneal injection, the anterior chamber filled with a grayish exudation, by which a small chip of steel was prevented from falling into the depth of the anterior chamber which had evidently been pressed through the cornea during the attempt at removal. By passing a knife through the cornea behind the piece of steel and a fine point of the electro-magnet through the channel of passage of this foreign body through the cornea, I succeeded in removing it with little trouble. The next day the exudation where my knife had passed it, began to melt away, also at the height of the anterior chamber. Five days later every trace of it had disappeared and although some small pigment spots could be seen on the anterior lens capsule no synechiæ remained behind and

the pupil was round and wide. The pain had ceased two days after the removal of the piece of steel.

In this case we have to deal with an uncomplicated croupous iritis due to an injury.

R. F., called on me with a spicule of steel, which had struck his left eye, sticking in the anterior lens capsule. This foreign body had been in the eye for three days and had caused a violent and excruciatingly painful inflammation. There was hypopyon and the remainder of the anterior chamber was filled with a croupous exudation, so that the very thin piece of steel could but barely be located in the center of the anterior lens capsule. Although I thought the eye lost, I attempted to remove the foreign body with Gruening's magnet, but it would not adhere. I only succeeded in disengaging it from the lens capsule. I then washed the anterior chamber clean by means of a syringe with a solution of bichloride of mercury, 1 in 5000, thus dislodging the croupous exudation, the foreign body enclosed within it, and the pus. The following night the patient was free from all pain and made a good recovery, no further croupous exudation nor pus formation took place. The cataract caused by the injury to the lens-capsule, was successfully removed later on.

Here we have a purulent traumatic iritis combined with a croupous iritis.

The following case was probably the severest case of croupous iritis I ever observed. It has also the further point of interest, that it was probably combined with a gummatous iritis, although this is not absolutely certain.

J. R., called on me on account of a dimness of vision in the left eye which he had noticed for a few days. He had been operated upon his left hand two weeks previously on account of what was pronounced a cancer, and which necessitated the removal of the little finger and metacarpal bones.

The pupil, when he first called on me, was small and there was little circum-corneal injection. Under the influence of atropine instillations a moderately broad synechia became visible which was situated up and outward. This synechia was

firm and in the following few days the iris-tissue at this very point assumed a yellowish appearance and swelled up, as we see this when a so-called gumma of the iris makes its appearance. At the same time a papular eruption showed itself in the patient's face and on his forehead. I now took the case to be surely one of syphilis and, with the consent of the surgeon who had operated upon his hand, gave him mercury internally. On Wednesday I showed him to the intermediate class at the Beaumont Hospital Medical College as a case of gummatous iritis. During the following night he had some attacks of severe pain, and the next day I could demonstrate the same eye to the senior class as one suffering from croupous iritis. At that time the croupous exudation did not half fill the anterior chamber, but it filled the whole anterior chamber the next day. The exudation, in this case, remained almost unaltered for nine days. During this time the inflammatory symptoms were considerably aggravated and several small hæmorrhages took place into the anterior chamber, followed by a large one on the seventh day during which blood in a considerable quantity was forced between the lamellæ in the lower part of the corneal tissue, as we see pus lying between the corneal lamellæ in abscess of the cornea. Finally on the tenth day the first signs of the melting of the exudation could be seen upwards and inwards and in six more days everything abnormal had disappeared from the anterior chamber. The synechia had almost become a circular one, but he declared vision as good as ever (""). The blood between the corneal lamellæ was gradually absorbed and when I saw him three months later a rust-brown spot in the lower part of the cornea marked the site of the former hæmorrhage.

In all of these cases we had to deal with croupous *iritis* alone. A milder type of croupous iridochoroiditis in both eyes, as stated, was clinically observed by Knapp. That the disease really does attack the choroid and ciliary body, I think the microscopical examination of the case published in the May number of the *AMERICAN JOURNAL OF OPHTHALMOLOGY* has proven.

The cases of croupous iritis reported in literature as well as these which I have added to them in the foregoing, give a certain clinical picture which is distinct from (although often mixed with) the types of iritis which no text-book disregards.

We have an inflammatory disease of the iris which is usually ushered in by severe pain, œdema of lids and conjunctiva, and circum-corneal injection, and which leads to the formation of a peculiar exudation into the anterior chamber. This exudation is formed rapidly and when noticed usually fills most or all of this space. It is a grayish-yellow semi-transparent substance often showing a coarser net-work of fibres. When it fills the anterior chamber completely, it can be recognized in its true character only by the fact that the corneal epithelium and parenchyma are transparent. During the period of its development and later on hæmorrhages into the anterior chamber are not infrequently seen.

After having apparently remained unchanged for a varying number of days, the exudation begins to clear up and melt from the periphery and the solid mass assumes in consequence a more or less lens-like shape, and sinking to the bottom of the anterior chamber leaves at first the upper part of the iris uncovered. It then presents a sharp and well-defined edge. This process of clearing and melting away is sometimes quite rapid but may take two weeks and more. I have seen one case in which it took twenty-five days. When the contents of the anterior chamber appear perfectly cleared up again, usually one or more posterior synechiæ are found, but the eye quickly recovers otherwise. In the uncomplicated cases not even a synechia may remain behind.

The true character of the exudation I have had occasion to study histologically a number of times. It consists invariably in the main of a minute network of finest fibres of coagulated fibrine containing few round-cells and in no way different from the exudation as seen in other croupous affections, as for instance in the tissue of the lungs in croupous pneumonia. I, therefore, think it is best to designate this form of iritis as croupous iritis. I thought that Dr. S. M. Burnett had so desig-

nated it, but, from his paper, I find that I was mistaken. With regard to the origin of this peculiar exudation I had formerly thought, that the hæmorrhages found clinically in the anterior chamber and histologically also in the iris-tissue might be the characteristic feature. This was probably wrong. In a number of cases in which I have of late been able to examine the voided exudation bacteriologically, as far as in my power, I have several times found clusters of cocci arranged in the manner of the staphylococcus pyogenes aureus. It seems, therefore highly probable that in this disease we have to deal with a special form of infection which is worthy of further study.

The rapid healing and immediate ceasing of all pain and of the inflammation after washing the anterior chamber with a solution of bichloride of mercury in one of the cases related is, perhaps, to be taken as a further proof of the correctness of this view, and might be made useful in the treatment of this form of iritis when it appears severe and does not yield readily. Otherwise, the treatment employed in cases of plastic iritis seems to answer the purpose fully.

SELECTIONS.

THE PATHOLOGY AND TREATMENT OF GRAVES' DISEASE.¹

BY W. H. THOMSON, M.D.,

Professor of Materia Medica and of Nervous Diseases, University of the City of New York; Physician to Bellevue and Roosevelt Hospitals.

The progress of pathology often illustrates the disadvantage of the premature naming of diseases after some of their common or prominent symptoms, for further knowledge may show the disease to have much wider relationships than at first suspected, and in some cases to exist without these symptoms being present. If such be the case, the symptomatic name may then operate to prevent a correct diagnosis. Locomotor ataxia is a good example of the concealing power of such names, for I have known of an elaborate diagnosis being made of a tumor in the optic thalamus to account for the optic atrophy of a tabetic patient who, though wholly blind, yet had no ataxic gait, while in other patients with this disease the significance of pains or of gastric crises has been similarly misinterpreted, because the motor symptoms were so little developed. In like manner the name exophthalmic goitre has had much the same influence in preventing the recognition of Graves' disease in many instances, and still more in confusing the views of its pathology. In reading the numerous contributions on the pathology of this interesting affection, it is striking to note how predominantly the conception of some text-

¹Read before the New York Neurological Society, March 17, 1893.

ural lesion in the nervous system that would account for the exophthalmia and the goitre has directed either the investigation or the speculation, in seeming forgetfulness of the fact that these symptoms are not essential to the affection, because they may be both present with Graves' disease absent, or both absent with Graves' disease present.

The safest rule to follow in pathological problems is to seek first for the most constant characteristics of a given complaint, rather than for the most obtrusive ones, for, when the latter are found to be wanting in some real cases of a given affection, they sink at once from the rank of a primary to that of an accessory relationship to its true pathology. Having found the most constant characteristic of the disease, we must even then keep to what is most constant about the characteristic itself when we come to analyze it, lest we be again turned aside from the right course by non-essential accompaniments. Thus the most uniform condition in Graves' disease is what may be correctly described as a state of marked agitation. In many instances it is for long a purely physical state, not involving the mind or the spirits, and yet the patient acts as if greatly alarmed about something. This has led many writers to pronounce fright to be a leading cause of the disease, and how far this hypothesis may be pushed is illustrated by Dr. Hector W. Mackenzie, in his excellent lectures on Graves' disease (*Lancet* September 1890), when he sums up its pathology by saying that if we can not show in each case that the patients themselves have so started from a fright, yet some of their ancestors may once on a time have been greatly terrified, and thus laid the foundation for Graves' disease in a descendant by what he terms an unconscious hereditary memory. We are thus at the outset diverted from the study of a truly characteristic condition to that of a most occasional element in the clinical history of the affection, and which is then made to do duty as a guide to its true pathology. The parallel instance of chorea, where fright is so often spoken of as a cause of the disease, naturally suggests the desirability of a new technical meaning of the term "cause" in medicine. It would be a great gain to restrict

its use only to some element, discovered or to be discovered, in the ætiology of a disease without whose presence the disease would not exist, while for all variable factors to employ some such term as occasion. Thus fright may be the occasion of the first manifestation of chorea or of Graves' disease, a blow the occasion of the development of a mammary cancer, a chill from exposure to cold the occasion for the development of a croupous pneumonia or of a pulmonary phthisis, but it is only a hindrance to our progress toward a correct pathology of either of these diseases to put down any one of the very varying occasions of its first manifestation as its cause. It would be better to defer rating anything that is occasional in a disease until its proper and quite subordinate place is settled by the due precedence being determined of the few constant over the many occasional elements. This is particularly the case with such a convenient cause to allege as fright in nervous patients, for not infrequently it may prove on examination that the patients had been for months in a state of true physical agitation before the accident of a mental impression occurred which they describe. In my last eight consecutive cases of Graves' disease in private practice not one of them would ascribe the initiation of the complaint either to fright or to any other emotional cause. Of course it is impossible to say what may have happened to their ancestors, but I think that a much nearer source of their bodily agitation may be found in their present living frames than in the dead past.

The first of the above-mentioned patients presented at her first visit a complete picture of the constant, in distinction from the occasional, symptoms of Graves' disease. I had known her well for some time, from having attended other members of her family, but she had always been healthy before, so that I had not seen her for some months. She showed no sign of either exophthalmia or goitre, but, as she now began her story, she seemed as if about hesitatingly to divulge some great cause of mental distress. Her voice trembled as if choked with emotion, her hands trembled, and her respiration was hurried and catching. She said, however, that she had had nothing

to make her so nervous, nor could she imagine why she was so, except that she had had diarrhœa all summer, but that other people had diarrhœa without being as nervous as she was. As soon as I examined her pulse, which was over 140, with a normal temperature, and noted that the muscular tremor was so extensive, I felt assured that she had Graves' disease, though it was not till long afterward that she showed any enlargement of the thyroid, and never up to her death from this disease, three years afterward, did she show any exophthalmia.

The second and third patients were sisters, the second a young unmarried woman with very rapid action of the heart and considerable enlargement of the thyroid, but no exophthalmia. She entirely recovered. Her sister was married and some fifteen years older. She had no marked goitre and but a very slight exophthalmia, but she had rapid heart action, wit very extensive throbbing of the arteries, and complained of frequent abdominal pains. She quite recovered for four years and then had a relapse, from which she has again improved. Both these patients had suffered from rheumatism, and the elder had a permanent hip lameness from it. They were both poor and hard-worked, but otherwise had no cause of mental depression or shock.

The fourth patient found her nervousness a mystery to her. She had naturally a lively disposition and she had contracted a fortunate marriage, so that she felt contented with everything in her life, when without apparent reason she became unaccountably nervous. She developed goitre and exophthalmia very rapidly, and with von Graefe's symptom very distinct, and she became both anemic and emaciated. The heart's action was violent and accompanied by loud systolic murmurs at the base and apex. After a year of most serious symptoms she gradually improved and is now in a fair state of health, with but moderate exophthalmia or goitre.

The fifth patient, a very accomplished lady and a happy wife and mother, came complaining that she lacked the repose of strength. She is a prominent advocate of the rights of

women, and hence felt humiliated at finding herself turning into a weak, trembling, nervous creature. She had enlargement of the right side of the thyroid, but no exophthalmia on either side. She had suffered from both rheumatism and chorea in childhood, and has now two children—daughters—who are beginning with choreic symptoms. Under treatment she wholly recovered.

The sixth case was peculiar in that the symptoms first developed when the patient was about sixty-five years of age. She had thyroid enlargement and was subject to suffocative nocturnal attacks like laryngeal crises. She had rather persistent albuminuria for six months, and during the course of Graves' disease she was extremely nervous and much troubled with insomnia. She wholly recovered for four years from all her symptoms, finally dying from pneumonia during the epidemic of influenza of April, 1891, at the age of seventy-four. She had a marked family history of rheumatism.

This lady, however, had a daughter, now about thirty-five years of age, who, after some years of delicate health, began to show a uniform enlargement of the uterus, which in about two years continued to increase until it reached the umbilicus. My friend Dr. Robert Watts examined her with me and pronounced it a myxomatous hypertrophy of the uterus, similar to a case which we both had together in the Roosevelt Hospital some years before, and in which afterward the late Dr. Peaslee performed hysterectomy at the Woman's Hospital. The interest of the present case is that, without any other symptom of myxedema, she has gradually become very enfeebled in mind, and presents an appearance of pseudo-exophthalmia, due to emaciation without retraction of the eyeballs. She has frequent movements of the lower jaw of a choreic character. Her pulse is slow and weak and her general condition the reverse of Graves' disease, as she is listless and apathetic. The thyroid gland seems to be wholly atrophied. Her case is interesting as one of cachexia thyrioidopriva in the daughter, with Graves' disease in the mother.

The seventh case of Graves' disease is that of a young mar-

ried lady who developed goitre without an exophthalmia and with rather severe tachycardia. She improved, but had not recovered, when she became pregnant. This did not seem to affect the disease one way or the other. She gave birth to a child at term, but it lived only a few hours. She is now, at the expiration of a year, improved, but not fully restored. No mental shock of any kind had ever occurred to this patient, who, on the contrary, is of a very equable temperament, without nervousness, so to speak, in spite of persistent palpitation.

The eighth patient, a married lady aged forty-four, I saw in consultation with Dr. Emil Mayer, of this city, into whose care she had come after suffering for eighteen months with lancinating pains in both legs, persistent headaches, insomnia, and muscular tremors; then persistent diarrhœa with emaciation, losing forty-eight pounds in weight, with progressive weakness till she could not leave her bed. Meantime her heart action was 140 and there was general arterial throbbing. Various diagnoses had been made in her case, including general tuberculosis, but because she presented no sign of either goitre or of exophthalmia, Graves' disease had not been suspected. I diagnosticated her case as such, and under the treatment for that affection, including galvanism, her diarrhœa soon stopped and her improvement was progressive, so that on seeing her two months ago she had regained her flesh and color and her pulse was 70.

Now, in neither one of these eight cases was fright or any other emotion an element of the clinical history. With the exception of the two sisters mentioned, they were, on the contrary, more than usually free from causes of mental strain or depression in their life environment or experience, and so far, therefore, they indicate that mental factors are accidental rather than essential elements in the ætiology of the complaint.

Of these eight cases, both exophthalmia and goitre were wholly absent in one. Exophthalmia alone was absent in five. Goitre was absent in one, and was present slightly and only late in the disease, just before death, in one. Both exophthalmia and goitre were marked only in one. But in all there was

the same pronounced tachycardia and muscular tremor, and in each there was emaciation—moderate in five and very pronounced in three. In four, imperfect inspiratory power was noted, but not so particularly as I shall look for it hereafter after reading Dr. Louise Fiske Bryson's observations of this symptom in Graves' disease.

I have chosen these eight cases from my private practice notes because they sufficiently illustrate the familiar features of the disease which I wish to dwell upon as most related to its pathology. One peculiar case I will only further mention, that of a patient who was sent to me by her physician four months ago, and who presented remarkable aneurysmal dilatations of the systemic arteries. There were several on the radial and on the right external carotid. The story was that they were transient in character. She had suffered a great deal from palpitation and tachycardia, but had no goitre or exophthalmia. Shortly after her visit she died suddenly with symptoms of hemiplegia.

The fact, therefore, that Graves' disease may exist even in a fatal degree of severity, as illustrated by the first patient in my list, without either exophthalmia or goitre, should be emphasized from the liability to the disease not being diagnosed, owing to the absence of these symptoms, as actually occurred in the case of the eighth patient. The enlargement of the thyroid is mentioned by all writers as very variable in degree and in duration, even in the same patient, and it is equally noted that the rapid action of the heart often both precedes the goitre and persists after its subsidence, it and the muscular tremor being the first symptoms to develop and the last to disappear, and together constituting the most invariable elements of the disease. Our attention, therefore, should be particularly directed to them as the most related to its pathology, and, moreover, the most important practically, as the earlier the recognition of the disease the better for its treatment. As to pathology, a paralytic lesion involving the common nucleus of the glossopharyngeal, vagus, and spinal accessory nerves, and extending to the neighboring vaso-motor center

in the medulla oblongata, would account for the whole group of symptoms which make up the picture of Graves' disease. In the first place, it should be noted that simple irritation of the lower branches of the glossopharyngeal and of the superior laryngeal nerves is sometimes accompanied by general muscular tremor. I once saw this amusingly illustrated by a stalwart young German butcher who came into my office trembling like a leaf because he had a fish bone stuck in his throat. He said in a husky voice that he was not frightened, but that he could not help shaking. With the laryngoscope I saw the bone directly across the chink of the glottis, and as soon as it was removed his shaking stopped. In experimental thyrioidectomy on monkeys and dogs the commonest immediate result is stated to be general muscular tremor, which lasts for many weeks. I regard this symptom as the direct effect of injury to branches of the superior and recurrent laryngeal nerves, which, according to Lindemann, are the only nerves which supply the thyrioid, rather than due to the effects of the removal of the gland itself upon the blood, for the tremor is much too immediate upon the operation to be so explained.

Now, such a bulbar lesion as we have supposed would also produce the other great constant feature of Grave' disease—namely, the tachycardia and the universal relaxation and throbbing of the systemic arteries. It would also explain the interference with the inspiratory expansion. It would not account, however, for the mechanism of the exophthalmia or of the goitre, though for the latter condition we have another cause to be mentioned presently. When we turn to pathological anatomy, however, we have no constant evidence of any textural lesion in the medulla, whether of the above-mentioned centers or of other parts. The experiments of Filehne, recently repeated with confirmatory results by Seeligmüller and by Bienfait, in which lesions of the restiform body produced increased pulse-rate and corresponding unilateral exophthalmia with muscular tremors, are open to the objection that it is difficult to perform such experiments without affecting contiguous bulbar centers. On the other hand, autopsies after

Graves' disease have not shown any constant distinctive changes in the restiform bodies any more than in the cervical sympathetic, which was once supposed to be the anatomical seat of the affection. These theories, moreover, share in common the objection that the enlargement of the thyroid and the exophthalmia are supposed to be the chief elements of the disease, which, as we have seen, is quite incorrect.

As pathological anatomy, therefore, has so far not revealed any truly characteristic change which can be causally associated with the genesis of Graves' disease, the question arises whether we can look elsewhere than to the nervous system for the *fons et origo* of the malady. Here I think that clinical experience may afford some significant intimations.

In the case of the first patient above mentioned I tried a great variety of remedies which I found recommended as serviceable in the treatment of this complaint. Belladonna, arsenic, nitrate of silver, the bromides, digitalis, and the iodides were prescribed in succession, without satisfactory results. The diarrhœa continued for many weeks unchecked by astringents, and the emaciation increased, with the rapid pulse and excessive nervousness and insomnia. At last I prescribed a complete change of diet, and ordered that the patient, who was now confined to her bed by her weakness and tremor, should be fed exclusively with matzoon and stale bread. The change for the better upon this diet was surprisingly rapid and progressive. The diarrhœa stopped without medicines, both her nervousness and sleeplessness improved, and finally the pulse became remarkably lessened. Iron then seemingly began to improve her anæmia, when before it appeared to aggravate her symptoms, and in the course of two months she seemed to be getting quite well. After four months she had so much improved that, contrary to my advice, she discontinued the matzoon and began to resume a meat diet, of which she was always very fond. Two months after this, on her return from the country, I found that all her former symptoms had recurred, including the diarrhœa. She again put on matzoon and again she improved, and this time she continued

the milk for about six months, with such a gain in flesh and color that she felt that she was well. She then went back to her ordinary diet, and I did not hear from her for some time, when I was called, to find her now worse than ever, because of the development of mental symptoms of both irritability and obstinacy which she had not shown before. She declared that she would rather die than take the matzoon, and nothing would persuade her to try milk in any form. One day I was sent for to see her because she seemed to be so low. I found her pulse to be with difficulty countable, and she was in a state of delirium with hallucinations. While I had my finger on the pulse, trying again to count it, it suddenly stopped, her pupils dilated, and the patient was dead with scarce a perceptible struggle.

Now, in this case a change of diet effected what drugs had quite failed to do; and then a first return to a meat diet brought back a return of the disease; then to be again and unmistakably arrested by discontinuing meat and resuming milk; and, lastly, a second return to meat brought back a fatal return of the disorder. This case has led me ever since that date (1880) to rely mainly on the dietetic treatment of Graves' disease, with such favorable results, both in hospital and private practice, that I have now little doubt that a specific disorder of intestinal, in distinction from gastric, digestion is a primary factor in the genesis of this affection. It is, of course, a familiar fact that diet has much to do with the therapeutics of functional nervous diseases, but until within recent years our practice in this respect has been based wholly upon empirical grounds. In such an instance as this, however, it is difficult not to infer a causal relation between the food taken and the resultant symptoms. The meat diet seemed to be not only a contributing but a direct cause of diarrhoea, tremor, and rapid heart action—as direct as we find in any other seemingly immediate connection.

That we have now more than empirical grounds for interferences about the relation of auto-infection to the genesis of many of the derangements of functional nervous diseases is as

well settled as any of the recent advances of pathology. In the processes of normal intestinal digestion it is claimed, on apparently well-ascertained facts, that the healthy system is constantly producing organic poisons, which are as capable of causing injury as any of the products of retrogressive metabolism in the body at large. We may therefore have specific disturbances occur from these organic poisons in either of two ways: First, by their excessive generation, or, secondly, by a failure in the normal functions of the body which are protective against them, from deficiency in the protecting functions of the organs themselves, or from a greater virulence in the poison generated than they can counteract. An effect from diet, therefore, in nervous disorders, one way or the other, would be explicable on chemical principles rather than on nervous textural changes, and, from my experience in the treatment of functional nervous diseases, I am becoming more and more persuaded that we have in this direction greater promise of progress, both in theory and in practice, than in hypotheses of irritative nervous lesions as the source of many functional disorders, Grave's disease included. On this point Dr. Fagge well remarks: "Some writers have endeavored to account for all the phenomena of the [Graves'] disease on a theory of irritation. But it is a sufficient objection to such a view that a primary irritation of a nerve center, lasting for months or years unchanged, is as yet unknown to pathology."

On the other hand we may say that, while a structural lesion in the medulla which would account for the phenomena of Graves' disease is almost inconceivable without its sooner or later involving all the vital functions of that seat of life, yet particular functional derangements produced by toxic agents are just what might be expected, for nothing is more characteristic than the narrowly selective operation of functional nervous poisons, which may go on for years, as in the case of opium, affecting certain functions without producing either progressive changes in them or extension to other functions.

The chief hindrance to committing ourselves to the toxic distinction from the structural ætiology of such diseases is the

considerable change which it involves in our views of the pathology of functional nervous diseases in general. It seems to offer too tempting, because too easy, a solution of many of the most obscure problems of practical medicine. That its advocates are often carried away by its far reaching conclusions is undeniable, and many of their deductions are open to criticism on the score both of haste and of hobby-riding. But just the same may be said of bacteriology—namely, that it is too much like a blazing comet passing through the medical sky, with a nucleus of fact surrounded by a cloud of seemingly mere gas, carrying a tail of still more tenuous interferences stretching out to infinity. We need not, however, surrender our nucleus of facts, nor legitimate inference based upon them, because everything can not be demonstrated at once in a newly discovered field.

Certainly there is one fact in Graves' disease which points much more distinctly to a digestive disorder than to a structural nervous lesion, and that is its occurrence in women about ten times as often as in men. We can hardly imagine that this difference is due to a difference in the medulla between the two sexes. That the digestive apparatus in women, however, is subject to special disorders is notorious. Many years ago I published in the Transactions of the Medical Society of the State of New York the case of a girl who, after a suppression of the menses from a wetting in a thunder shower, had first an obstinate constipation, which was attributed by the late Dr. White, Professor of Obstetrics in Buffalo, and for a time also in Bellevue Hospital Medical College, to intestinal obstruction, as she had developed stercoraceous vomiting. In the further progress of her case, however, her bowels were made to act, but the dejecta showed a total absence of coloring matter. She then had sudden suppression of urine, which was soon followed by profuse salivation and lachrymation, but which stopped after five days, when the kidneys started secretion again, and this alternation between the flow from the bladder and from the mouth continued at intervals till her death, about three months after the beginning of her affection,

Such a case, however, only illustrates in an extreme what derangements in the secretions and in the chemistry of the products of the blood-making and of the blood-purifying glands can take place from nervous disorders in the splanchnic system of women, and hence renders the surmise probable that if auto-infection from the intestine can take place at all, it may be looked for in women with special frequency. I may mention, therefore, in this connection, that I have not yet seen a case of severe Graves' disease in which diarrhœa was not sooner or later a prominent symptom.

On the other hand, it may be asked, if the symptoms of Graves' disease are to be ascribed to toxic infection of the blood by intestinal poisons, what relation has that fact to the common implication of the thyrioid in this affection? To this it may be replied that the facts of both sporadic myxœdema and cachexia following thyrioidectomy, in both man and in animals, point much more to a metabolic function of the thyrioid than to a secreting one. It may be questioned whether such be not the main function of the ductless blood gland—that is, that they produce changes in the blood passing through them that may free the blood of otherwise toxic products, rather than that they add particular secretions of their own to it. The interesting experiments of Grützner seem to support this conclusion as regards the thyrioid, for he found that the blood of an animal from which the thyrioid had been removed, when injected into the veins of another animal, caused symptoms in it similar to those observed by Kocher in operative myxœdema in man.

The phenomena of Graves' disease, however, are those of excessive action of the thyrioid, rather than those of the contrasting symptoms of thyrioid atrophy; as if the gland were overstimulated by some ingredient in the blood which it can not sufficiently neutralize, for it is noticeable that the thyrioid is found in many cases not so much diseased after death as that its proper tissue is apparently hypertrophied. Certainly it often seems so to act in these patients during life, presenting a variation in bulk which causes it to resemble an erectile

tissue in its alternate enlargement and subsidence, so different from endemic or ordinary goitre. This appears to me a much more probable explanation than the view of Chevalier, who ascribes Graves' disease to an intoxication of the nervous system by products of the thyrioid, because it is rather removal or atrophy of the thyrioid which is most constantly followed by signs of an intoxication due to the absence of its preservative functions.

As to the relation of a meat diet to disorders of the thyrioid, I will only cite for what they are worth some references to published observations. L. Breisacher, of Leipzig, finds that meat and meat extractives exert a poisonous influence on dogs after thyrioidectomy. Ewald and Rockwell are quoted in in Sajous's *Annual of the Universal Medical Sciences*, 1891, as finding the removal of the thyrioid in pigeons to exert no perceptible influence on their health. They chose pigeons as pure vegetable feeders, to corroborate the earlier observations of Ewald, in which he ascribed the difference in the effects of thyrioidectomy between dogs and rabbits to the difference in their diet. Charcot, in his lectures on Graves' disease, lays special stress on the benefit to be derived from a milk diet.

Now that examination of the urine includes so much more than tests for albumin or sugar or the proportion of urea, there is much to be hoped for in researches of its composition in cases of functional nervous diseases. The chemistry of the urine, however, is evidently not an easy subject either in health or in disease. The existence of alkaloidal poisons in it is very variously reported, but meantime there is no reason to be incredulous that much light is yet to be thrown upon the relation of toxic ingredients in this secretion to the clinical facts of a great variety of morbid conditions. As regards Graves' disease, I find a reference in Sajou's *Annual*, 1892, to researches by Boinet and Silbert, reported in the *Marseilles médical*, who profess to have found three principal varieties of ptomaines in the urine of a case of exophthalmic goitre. One possesses a convulsive action and produces arrhythmia, weakens the systole and arrest of the heart in diastole, while an-

other causes a primary increase in systolic energy and afterward enfeeblement and arrest in diastole. Such observations, however, of urinary ptomaines in disease are not yet sufficiently uniform or distinctive to claim much authority.

My treatment of Graves' disease is mainly based upon its supposed relation to digestive disorders. In the first place, it seems to me that a meat diet is to be as much restricted in these patients as a starchy diet in diabetes. Fresh, undiluted milk also is, in my experience, not to be allowed, from its indigestibility with most healthy adults. It is a significant fact that races like the Tartars, the Beduins, and the Guachos of South America, who have to live upon milk, have all found by experience that it has to be fermented first before it can become a staple and, as with them, about their only daily diet. All the world over the ferment for this purpose is the same—namely, the yeast plant. With fresh, good milk fermented every day, as it is by the Arabs and the peoples of western Asia, and now sold here pretty extensively under the Turkish name of matzoon, I have relieved more cases of vomiting from organic diseases of the stomach than by any other one article. In Graves' disease it has in my experience, as above mentioned proved especially beneficial.

Medicinally, I think it is well to begin treatment by a mercurial purgative, as the ordinary blue pill, to be repeated occasionally from time to time. In some patients this will be found particularly useful against the diarrhœa. Then, three or four times a day, I prescribe in capsule five grains of equal parts of bismuth subcarbonate and powdered calumba, with four grains of salol and five of benzoate of sodium; or capsules of ten grains of bismuth salicylate with two of B-naphthol and two of ichthyol. The best time for these intestinal antiseptics to be taken is an hour after meals.

As a vaso-motor tonic, I now rely chiefly on ten-drop doses of tincture of strophanthus half an hour before meals.—*New York Medical Journal*.

EYE TUBERCULOSIS AND ANTITUBERCULAR INOCULATION IN THE RABBIT.¹

BY E. L. TRUDEAU, M.D., SARANAC LAKE, N. Y.

GENTLEMEN.—At the last meeting of this association I presented a paper on the Treatment of Experimental Tuberculosis, illustrating the influence of such treatment on eye tuberculosis in the rabbit by photographs and living animals. The two last conclusions reached were as follows:

“Experimental tuberculosis in the rabbit’s eye can be cured by such injections. The permanency of this cure has not yet been established.”

A more extended experience has shown me that the cure of inoculation tuberculosis in the rabbit’s eye by this method is by no means always a constant result or one which can be brought about invariably at will. I have failed often where I had every reason to expect success, and I have succeeded where I had no special reason to hope for a favorable result. This inconstancy in results may be explained by the great difficulty of controlling the relation existing between all the factors involved in the problem, such as the virulence of the bacilli injected, their number, the virulence of the microbes from which the tuberculin was made, and the degree of individual resistance possessed by each animal. Cures do occur, however, and appear to have a certain degree of permanence, as the two animals I now show you illustrate. These rabbits were inoculated in the eye with cultures of tubercle bacilli of human origin more than a year ago. The eye of the untreated control is cheesy and atrophied. That of the treated animal

¹Remarks made before the Association of American Physicians at its eighth annual meeting.

shows but the fibrous evidence of the inflammatory changes of which it has been the seat; the sight is unimpaired, the cornea clear, the inoculation wound a mere corneal scar; the iris, dilated and showing on its surface small grayish fibrous specks at the site of the once evident miliary tubercles, is still adherent to the lens by fibrous bands, while the vascularity of the eye is normal. The present appearance has remained unchanged for six months.

Hitherto the tubercle bacillus has always been considered as a pathogenic microbe having but one source and possessed of a very constant degree of virulence. More recent researches by Maffei, Koch, Metchnikoff, Courmont and Dor, and Loeb have taught us that the virulence of this germ varies greatly and that there are two distinct races of tubercle bacilli—the mammalian and the avian. Loeb's experiments made in Koch's laboratory demonstrated that bacilli cultivated uninterruptedly for nine years and having descended from the original cultures used by Koch in his first experiments and which then killed both guinea-pigs and rabbits within six to ten weeks, were no longer pathogenic for rabbits and but slightly so for guinea-pigs. Principally through the labors of the above-mentioned investigators it has also become known that the avian tubercle bacillus is apparently a race by itself and that it presents certain quite constant cultural and pathogenic peculiarities not observed in the microbe originally discovered, studied, and described by Koch. Whether these variations have merely been acquired by Koch's bacillus as the result of a long parasitic life history in the organism of birds, or whether they indicate a permanent difference of race, is still a disputed point; as yet, however, it has been found impossible by laboratory and inoculation experiments to show that either variety of these germs can be transformed into the other. In 1890 I presented and described before this association cultures of the tubercle bacillus which were not pathogenic for guinea-pigs and which showed marked cultural variations from the standard. The original source of these bacillary growths was somewhat doubtful, as they had been brought from Europe,

and I supposed them to have become attenuated while under cultivation. In the light of recently acquired facts, however, it is quite evident that these attenuated cultures were bird tuberculosis, and the description then given will answer very well for the avian microbe as we now know it. In growing this variety of the tubercle bacillus from the lesions of tubercular birds, not only have I been able to confirm many of the observations made by Maffucci, Koch, and the French experimenters, but I have been struck as well with two marked peculiarities which I have not seen described:

1. The ease with which the chicken bacillus adapts itself to a saprophytic existence, which is in strong contrast to the well-known difficulty of obtaining first growths of Koch's bacillus in artificial media, for the avian microbe grows readily direct from the lesions of birds in most of the media in use, whether solid or fluid.

2. The strong anaerobic attribute possessed by the bird bacillus, which enables it to thrive readily within and beneath fluid media as well as on the surface, while the human microbe grows only when floated on the surface of liquids and in constant contact with oxygen, and develops almost imperceptibly or not at all when immersed. The human bacillus has been found by all observers to be about harmless for birds; though in rare instances intra-peritoneal inoculations may cause an eruption of tubercle in these animals, intra-peritoneal re-inoculations of this tubercle prove negative and the animals remain healthy. The avian bacillus, when fresh from the lesions of birds or when cultivated but a short time in artificial media, is about harmless for dogs and guinea-pigs. Rabbits are, however, more susceptible to it, and die readily from intravenous, intra-peritoneal, and intra-thoracic injections of not excessive amounts of these cultures. On autopsy, they may either show extensive generalized tubercular lesions or they may present no evidence of tubercle in any organ, but an extreme emaciation only, as if they had died of chronic septic intoxication. When a small amount—0.05 to 0.25—of liquid culture grown a month direct from the chicken is injected under the skin, the

animal generally recovers; an abscess is formed at the site of the inoculation which tends slowly to soften and become diffuse and, finally, if the animal survives, disappears almost entirely. This brings us to the subject of preventive inoculation.

Antitubercular inoculation was first tried by Falk in 1883, and all attempts in this direction have resulted until recently in but an unbroken record of failures. In 1890 I added my name to the list of those who found it impossible to produce immunity in animals by this method. In 1890 Martin and Grancher and Courmont and Dor claimed to have produced in rabbits a certain degree of immunity by previous inoculation after Pasteur's hydrophobia method of avian tubercle bacilli of graded and increasing virulence. These vaccinations were, however, frequently fatal to the animals, and the immunity obtained was but slight. Richet and Hericourt have since claimed to produce complete immunity in dogs by intravenous inoculations of bird tubercle bacilli. These experimenters found that though harmless to the dog when first derived from the chicken, bird bacilli, by long cultivation in liquid media, became pathogenic for this animal, and by thus grading the virulence of the injections, complete immunity against any form of tubercular infection was produced in the dog. As yet these striking results have not been confirmed. The animals which I now present to you illustrate an attempt I have made along the same line to produce immunity in the rabbit. Cultures grown directly from the chickens' lesions in bouillon for first five weeks, then six months, were twice injected subcutaneously at intervals of twenty-one days in doses of 0.025 and 0.05, and a third injection of a still older culture was occasionally given.

About one in four of the rabbits died within three months, profoundly emaciated, but without any visible tubercular lesions. The remaining animals recovered and were apparently in good health when, together with an equal number of controls, they were inoculated in the anterior chamber of the eye with cultures of Koch's bacillus derived from the tuberculous lesions of the rabbit and cultivated about three months on glycerin agar. The results of these inoculations present many

points of interest. In the controls, as is usually the case, if the operation has been done carefully and aseptically and with a moderate amount of dilute virus, two days after the introduction of the virulent material in the eye little or no irritation is observed, and little is to be noticed for two weeks, when a steadily increasing vascularity manifests itself, small tubercles appear on the iris which gradually coalesce and become cheesy, intense iritis and general inflammation of the structures of the eye develop, the inoculation wound becomes cheesy, and in six to eight weeks the eye is more or less completely destroyed and the inflammation begins to subside. The disease, however, remains generally localized in the eye for many months, and even permanently. In the vaccinated animals, on the contrary, the introduction of the virulent bacilli at once gives rise to a marked degree of irritation. On the second day the vessels of the conjunctiva are tortuous and enlarged, whitish specks of fibrinous-looking exudation appear in the iris and in the anterior chamber, and more or less intense iritis supervenes, but at the end of the second to the third week, when the eyes of the controls begin to show progressive and steadily increasing evidence of inflammatory reaction, the irritation in those of the vaccinated animals begins slowly to subside and the eyes to mend. The vascularity is less, the whitish spots of fibrinous material appear smaller, the structures of the eye become clearer, the inoculation wound is but a bluish, fibrous scar, until in from six to twelve weeks in successful cases all irritation has disappeared and the eyes present, as in the animals I now show you, but the fibrous evidence of the traumatism and the inflammatory processes which have been set up by the inoculation. In all the controls, as you see, the inoculation wound is cheesy and the cornea and iris are more or less destroyed by tubercles and cheesy areas.

Some of the protected animals slowly relapse, and the one I now show you has small tubercles growing on the iris; but even in such eyes the entire absence of caseation is noticeable and the disease progresses almost imperceptibly. I have repeated this experiment on three sets of rabbits with about the

same results each time. The vaccinations as practiced are of themselves, in some instances fatal, but the fact remains that where recovery takes place a marked degree of immunity has been acquired. I do not lay any claim, therefore, to have produced a complete or permanent immunity by a safe method but it seems to me that these eyes constitute a scientific demonstration of the fact that in rabbits preventive inoculation of bird tubercle bacilli can retard and even abort an otherwise progressive localized tubercular process so completely as to prevent destruction of the tissues threatened, and that the future study of antitubercular inoculation may not be as entirely hopeless as it has until recently appeared.—*N. Y. Med. Jour.*

NEWS.

A WEEK ON CATARACT.

The Philadelphia Polyclinic will devote a special week, beginning October 30, to the consideration of cataract. Cataract operations will be done by the different methods preferred, by Professors Harlan, Jackson, Risley, and deSchweinitz, including both extraction with iridectomy and simple extraction. The whole subject including points of etiology, diagnosis, the dressing and after treatment of cases will be considered.

In addition to clinic, demonstrations, and practice of operations on the eyes of lower animals, there will be a series of conferences participated in by the Professors and Members of the class, such as have on former occasions been found both interesting and profitable.

OPHTHALMOLOGY.

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ORIGINAL ARTICLES.

SOME PHASES OF HYSTERICAL AMBLYOPIA.¹

BY S. C. AYRES, M.D., CINCINNATI.

The numerous and many-sided phases of hysteria are quite familiar to the members of the Academy. You have opportunities of seeing its manifestations in your practice and are constantly on the alert lest you are mislead by them. If we may call it a disease, it is one which claims the entire body as its field of operation. It goes roaming around among muscles and nerves and tissues in general, like a will o'-the-wisp skipping from place to place, vanishing without leaving a trace behind it, and reappearing as suddenly again. It is an ignis fatuus which may well claim our most earnest study, as its masked form may stand in our way to mislead us.

Its manifestations are legion. We see it in general convulsions, in limited convulsions, involving only a group of muscles, in an arm or a leg, in the diaphragm, in the respiratory muscles and in the vocal cords. We see it in local anaesthesia and hyperaesthesia, and in the emotions, as laughing, crying, etc.

The special senses of sight and hearing are not exempt from

¹Read before the Academy of Medicine October 30, 1893.

its influence, and it is to a few observations in relation to the former that I wish to call your attention. The patients were all females, but the opposite sex is also subject to hysterical influence.

CASE I.—CONCENTRIC CONTRACTION OF THE VISUAL FIELD.

Mrs. P., æt. 32, a tall delicate looking woman of nervous temperament, came to me first in December 1892 for the removal of an angioma, of the size of a pea, which was located near the inner angle of the left upper lid. The removal of the growth was easily accomplished, and I then examined the refraction. I found her very amblyopic, but was able by means of cross cylinders to bring the vision of the right eye up to 0.5, and the left eye to 0.1. The glasses were very satisfactory and she returned home well pleased with the improvement which they gave her. A month later she wrote me that a few days previously she had so far lost her vision that she was unable to read and it was with difficulty she recognized her friends. When I examined her I found she could count figures at only 2' ($V = \frac{2}{cc}$). I found the visual fields contracted almost to the point of fixation. In a test with two candles when she fixed on one of them and the other was made to approach the one fixed upon, she did not see it until it came in line with the former. The ophthalmoscopic examination was negative. There were no retinal or choroidal alterations to account for her amblyopia. In spite of this, however, she was able to go around with apparent ease. She had suffered from ovarian disease for some time past, had painful menstruation and her health was poor. In the absence of any local manifestation in the fundus oculorum I concluded that the attack was hysterical and depended on some reflex influence. A course of treatment consisting of rest, electricity, massage and tonics, restored her concentrically contracted field of vision as well as her normal acuity of vision. The recovery was slow but satisfactory, and since I saw her last I think her eyes have remained in good condition.

CASE II.—SUDDEN BLINDNESS OF ONE EYE. CENTRAL SCOTOMA.

Mrs. F. æt., 35, has generally enjoyed good health until recently. Her right eye is amblyopic but the left one has vision of 0.9 with compound hyperopic astigmatism corrected. She wears her glasses comfortably and does not suffer from asthenopia. In the early part of the year I changed her glasses and found her vision as good as usual. Shortly after this she called on me in great alarm, saying that she had suddenly lost the sight of her left or good eye. She could not read ordinary print and all things around seemed to be in a haze. A critical examination with the ophthalmoscope did not reveal any pathological lesions in the fundus. Her peripheral vision was good, but the central field was obscured by a cloud and acuity of vision reduced from 0.9 to 0.1. Her nervous condition, disturbed menstruation and the negative result of the ophthalmoscopic examination, decided me in the belief that she was suffering from hysterical amblyopia.

In a short time, under the judicious care of her family physician, the scotoma disappeared and she recovered normal vision again. Her health was not fully reestablished for several months, but at present she is quite herself again.

These two cases, occurring in women of nearly the same age, present conditions, as far as the field of vision is concerned, which were diametrically opposite. In the first one there was a contraction of the field down to the point of fixation. Several tests were made with the perimeter, and all with the same result. As she improved the field gradually enlarged until it became normal.

In the second case the amblyopia involved the central field, but this also disappeared, and when I tested her last her vision was as good as before the attack.

CASE III.—HYSTERICAL AMBLYOPIA. SUDDEN DISAPPEARANCE OF THE SAME WHILE UNDERGOING A REFRACTION TEST.

Miss L., æt. 13, school girl, came for consultation in relation

to her eye, saying that several months previously she had practically lost the sight of the right eye. I supposed it to be a case of amblyopia *ex anopsia* and that she had really never seen well with it. She assured me, however, that she formerly saw well with it. I was particularly careful in testing it, but failed to bring her vision above 0.05. Vision of the left eye was perfect. Fundus of both eyes sound. Homatropine was used and the test then made. The left eye revealed a moderate degree of hypermetropia, but with perfect vision, and then I tried the right eye. To my great surprise she read one line after another with the aid of a weak convex glass, the same that suited her left eye, until she read the top line. Her vision rose from 0.05 to 1, and this change took place while she was in my waiting room. What brought it about? Was it the impression made on her mind by her examination and the surroundings of a surgeon's office? Before she came in she feared some operation might be necessary, and this made her dread the visit. But her confidence was soon gained, when she found she had nothing to fear. She enjoyed good health and there was nothing unusual in the menstrual function which had been recently established. She attributed it to study at school, and it is possible that this was indirectly the cause, but it vanished as suddenly as it came.

CASE IV.—HYSTERICAL AMBLYOPIA. SUDDEN DISAPPEARANCE OF THE SAME DURING REFRACTION TEST.

Miss C., æt 16, complains of headache and asthenopic symptom. She cannot study comfortably, and attributes her trouble to her eyes. Her right eye has a vision of 0.9, but her left eye only 0.3. She says that recently her left eye became so imperfect she cannot see well with it. I questioned her very closely in relation to the change in her left eye, as the ophthalmoscope revealed no fundus lesion, for I considered it a case of congenital amblyopia which she had accidentally discovered. It happens not infrequently that cases of congenital amblyopia are discovered while critical examinations

for refraction are being made, and this seemed to be one of them. I repeated my test two or three times, and, finding no glass to improve the vision, concluded it was a case of long standing amblyopia and that she was mistaken in her statement. The homatropine was then used, and the right or good eye was found to have a H. of 1 D. with perfect vision. The left one was then tested, and as in the above case she had a vision of 1 with a weak spherical combined with a weak cylindrical. Her vision increased from 0.3 to 1, the amblyopia disappearing while she was waiting for the final test.

These two cases may be grouped together, as they are similar and as their ages were nearly the same. That the amblyopia should vanish while the refraction test was being made was a strange coincidence, since there was only a short interval between their visits. I feel quite confident that the *force* work which is done in our schools, both public and private, is responsible for such hysterical manifestations as well as for much of the asthenopia.

The dread of periodical examinations, the lack of sufficient out door exercise, and the persistent stimulation of the brain outside of school hours, by lectures and general reading, must tend to disturb the sensitive menstrual function in growing girls. I have seen girls, and boys too, from 13 to 16 who complained of headache from eye strain where all they needed was to be taken out of school. Once free from the surroundings of school, the pain disappeared. Some children grow very rapidly during this period and are not able to study and grow at the same time. All such should be sent to the country, to ride horse back, hunt squirrels, or do some light and agreeable work. This is easy advice to give, but both patient and parents are found who are unwilling to follow it. They are anxious to get through a certain grade, and do not want to fall behind a class. Time seems a more important matter than health, and the children are allowed to go on keeping up with their class even at the risk of health.

About four years ago I had as a client a very studious and ambitious miss of fourteen. Her eyes suddenly gave out and

she could not study. She had an error of refraction which was corrected, but still she could not study. I encouraged her by promising recovery, but could not say when; I could only say it might be in six months or a year or even longer. I advised her to take out of door exercise, to ride horse back, to entertain herself as best she could, but not to study. She did not have hysterical amblyopia, for vision was perfect in both eyes, but she had then asthenopic symptoms, which are associated with the development of menstruation. It was more than a year before she recovered, but the recovery was complete and the rest she had was a great benefit to her physical condition. These asthenopic symptoms sometimes precede the first menstruation for several months and then disappear as soon as the function is established.

CASE V.—HYSTERICAL PHOTOPHOBIA.

Let me mention a case of hysterical photophobia. A young lady had a severe keratitis of the left eye, from which she recovered after a course of treatment lasting two or three weeks. Her recovery was complete and she went home in good condition. A few weeks later she came down, saying that her trouble had returned in full force. The photophobia was intense. It was with difficulty I could see the cornea, as she would scarcely allow any light on it. After much difficulty I inspected the cornea, and found no traces of the former inflammation and no new developments. She suffered from dysmenorrhea, and, presuming the photophobia to be hysterical, I concluded to try a method, which although severe would make a physical and mental impression. I told her I would have to treat her eye in a different manner from what I did before, but assured her she would be well in three days. I then inserted a strong spring speculum between the eyelids and let it open as far as possible. It was very painful but she stood it well, although the tears were streaming down her cheeks. After releasing her I told her the same operation would be repeated the next day. On the following day she

said she was better and yielded with reluctance to the treatment. She complained more of the pain produced by the speculum than she had done the day before. The next morning she walked into my office with the eye wide open and no photophobia, saying that she was well.

These are samples of some of the hysterical manifestations which have recently come under my observation.

Occasionally a person is seen who has hysterical blindness in both eyes, and it is not an assumed blindness. There can be no object in deception in these cases, and the surgeon has to accept the statements of the patients and treat them accordingly. Dr. Harlan, of Philadelphia, reports a case of hysterical blindness of one eye in a young man which lasted ten years and then disappeared while his refraction was being tested. He was very much delighted to get the sight of the eye again.

Dr. Moore, of New York, reports hysterical blindness of one eye in three young men, all of whom recovered promptly under treatment.

The successful management of these hysterical cases requires tact and judgment, as well as judicious general treatment where the uterus and its appendages are involved.

COCAINE POISONING.—REPORT OF CASE, WITH ALARMING SYMPTOMS.¹

BY ALBERT R. BAKER, M.D., CLEVELAND, OHIO.

Mrs. Opterheida, referred to me by Dr. Sihler, of Cleveland, for obstruction of nasal duct and dacryo-cystitis of long standing. Preparatory to slitting the canaliculus, I put into the eyes two drops of a six per cent. solution of cocaine. The cocaine used was in the shape of the soluble tablets for making extemporaneous solutions, prepared by Sharpe and Dohme, of Baltimore, and the solution was prepared and used by myself in the morning of the same day upon a boy about twelve years of age, with strabismus. Although fifteen or twenty drops were used in this case there was no symptom of poisoning. After waiting two or three minutes the canaliculus was slit and three drops injected into the lachrymal sac. I then attempted to pass a lachrymal probe. Patient complained of pain and three more drops were injected, making eight drops in all. Almost instantly the patient complained of feeling queer, commenced talking incoherently, soon became unconscious and commenced having clonic convulsions of all the extremities. Respiration became frequent and sighing. The face was flushed, the pulse became somewhat accelerated and irregular, sometimes 120 to the minute and in a short time running down to 50; but it was at no time very weak. The convulsions lasted for over two hours. Inhalations of ammonia and later on of nitrite of amyl were tried without any apparent benefit. As the patient was unconscious and it was found impossible to

¹Read before the Cleveland Society of Medical Sciences.

compel her to swallow, a hypodermic injection of brandy was given.

As the patient emerged from the unconscious condition she became wildly delirious, requiring the constant services of two or three medical students to prevent injury to herself or others. Her mind was filled with the most extravagant hallucinations, in many respects resembling that produced by poisoning with duboisine or cannabis Indica. At one time she would see many objects on the floor, at another be earnestly sewing and then she would imagine we were trying to do her bodily harm, all the time talking and gesticulating as vehemently as in acute mania. These symptoms continued for about six or eight hours and were so persistent and violent that we did not feel justified in removing her from the office before nine or ten o'clock in the evening. She slept but little during the night, suffered somewhat from headache the following day, but otherwise recovered completely. As soon as she could swallow, aromatic spirits of ammonia were given, also strong coffee and inhalation of ether was tried sparingly to control the violent maniacal symptoms.

It is possible that a more heroic use of this remedy or even a hypodermic injection of morphine might have allayed these very embarrassing symptoms. One of the most persistent hallucinations was that we were delaying her for improper purposes. Although I could not find that there were any erotic symptoms, as one physician thought who happened to call at the office during the height of her delirium. This observation is of interest in connection with the following case.

Dr. C. W. Richardson in the *Journal of the American Medical Association*, 1888, reports a case of cocaine poisoning in which there were some very peculiar symptoms. In a well-developed, well-nourished, married woman, twenty-five years of age, with one child, five drops of a ten per cent. solution of cocaine were injected into the septum of the nose. In a very few minutes the patient, to the disgust, surprise, and consternation of the patient's lady companion, began to manifest the

most remarkable and decided evidence of erotic excitement, both by actions and words.

Although I have used cocaine in very large quantities almost daily ever since it was brought to the notice of the profession, this is the first case in which I have had any very alarming symptoms of poisoning and, consequently, I was very much surprised, to say the least, to have such unusual results from such a small quantity of the drug; not infrequently I have had patients complain of nausea, a cold sweat start from the forehead, the lips become pale and, when cocaine was used in the pharynx or larynx, some temporary interference with respiration; but upon placing the patient in a horizontal position these symptoms have all passed away in a few minutes. I have usually attributed these phenomena more to the effect of fright or the sight of blood than to the cocaine; but in the light of the present experience and my more extended examination of the literature on the subject I am inclined to think that the use of the cocaine had more to do with the production of these symptoms than I had heretofore supposed. In fact I am now led to look upon these symptoms as serious manifestations of poisoning.

I believe that the profession have not reported fully enough their unfortunate experiences with cocaine. In order to bring the matter before you in a somewhat more graphic manner I attempted to collect and tabulate cases of cocaine poisoning, but I soon found this a task of such herculian proportions that I was obliged to abandon it. There have been over four hundred cases of poisoning reported from this drug. I have been able to collect reliable data of only ten cases in which death has resulted as to exact age, dose, symptoms, etc. I have found altogether twenty-one cases of death reported, but in eleven of these the reports were too meager for tabulation. I have no doubt but that many deaths have occurred which have not been reported.

CASE.	AGE AND SEX.	REPORTER.	DOSE.	METHOD OF ADMINISTERING.	SYMPTOMS AND REMARKS.
1	70	F. Abadie of Paris.	$\frac{1}{4}$ gr.	Hypodermically in eyelid.	Immediate unconsciousness. Partially recovered. Sent home. Died in four hours.
2	29	M. Sims of Philadelphia. Gaz. de Hospital.	Idrachm 20 per cent	Injected into urethra.	Epileptiform convulsions. Face cyanotic. Death in twenty minutes.
3	18	F. Zambrache. Br. Med. Jour.	$3\frac{1}{2}$ gr.	Hypodermic injection.	Epileptiform convulsions. Death in twenty-five minutes.
4	40	F. Montelli. British Med. Journal.	23 gr.	By the mouth.	Delirium. Lips cyanotic. Unconscious. Died in (one hour) short time.
5	30	M. London Lancet.	10 gr.	By the mouth.	Opisthotonos, limb spasms. Death in one hour.
6	29	F. Jour. f. Zeit.	1 gr.	Hypodermic injections into gum	Collapse. Death in a few minutes.
7	11	F. Knabe of Berlin	4 drops of 4 per cent sol. $\frac{1}{2}$ gr.	Hypodermic injection into deltoid muscle.	Death in two minutes. Deathly pale. Unconscious. Had weak heart following scarlatina.
8	Young girl.	Lyons Medical.	5 in a 11 amount	Hypodermic injections into the gums.	Suddenly became faint and fell dead in hands of bystanders. Court exonerated dentist from homicide, but fined him for practicing medicine without license.
9	34	M. W. H. Long. Am. Lancet.	2 percent solution.	Small quantity brushed into the larynx	Suddenly stopped breathing. Became unconscious. Partially recovered. Again became unconscious. Died in about three hours. Had a similar experience a few days previously, patient only recovering after artificial respiration.
10	25	F. Prof. Kohn, of St. Petersburg.	96 gr.	Rectal injection. Four injections of 24 grs. each.	Pulse weak. Respiration labored. Face cyanotic. Prof. Kohn suicided.

The following is a case reported to me in private conversation by a reliable medical gentleman who was present at the death of the child has never been reported. Indeed the *London Lancet* in commenting on a case of death in the University College Hospital a couple of years later said that it was the first death from cocaine in England. The case as related to me was that of a girl about twelve years of age in McKenzie's Royal London Throat Clinic, who had a considerable quantity of cocaine sprayed into the post-nasal cavity for the removal of adenoid vegetations. These were removed and the patient was sent to another room; while putting on her wraps preparatory to going home she suddenly became faint, turned pale, a cold sweat appeared, assistance was called and notwithstanding the hypodermic use of stimulants, electricity and artificial respiration the patient died in a few minutes.

The following reference to published cases of death from cocaine not included in the above tables may be of value to any one wishing to make a more exhaustive study of the subject.

A case reported in the *London Lancet* of October 10, 1891, in which a physician was found dead in a water closet as the result of an overdose of cocaine taken by himself, a short time previously to relieve pain.

A case referred to editorially in the *Medical Press and Circular*.

Ricket reported a case in which death resulted from spraying the throat, with a four per cent. solution, in glossitis.

I find several references to a case reported by Dr. Coleman but failed to find a report of the case in any of the journals to which I have access.

The unfortunate death of Dr. Mendenhall, of Cincinnati, from chronic cocaine poisoning, will no doubt be remembered by all.

In addition to these cases Debose, in the *Journal de Medicine et de Chirurgie Practique*, Paris, reports five cases in which death has resulted from the use of cocaine.

Death resulted in the following ten tabulated cases:

From hypodermic injections,	-	-	-	-	-	3
From hypodermic injections into the gums,	-	-	-	-	-	2
From being brushed in larynx,	-	-	-	-	-	1
From rectal injections,	-	-	-	-	-	1
From urethral injections,	-	-	-	-	-	1
By the mouth,	-	-	-	-	-	2

10

The largest fatal dose was that of twenty-four grains repeated four times in bowels.

The next largest fatal dose was that of twenty-three grains by the mouth.

The next largest fatal dose was that of twenty-two grains of the mouth.

The largest fatal dose by hypodermic injections was that of three and one-half grains.

The smallest fatal dose by hypodermic injections was that of one-third of a grain. (Less than the quantity necessary to kill with morphia).

The next smallest, hypodermically, two-thirds of a grain.

The next smallest, hypodermically, one grain.

Six of the cases died in collapse and four had convulsions.

These observations would teach us that there is a fatal dose of cocaine, that it may cause death in from one-third to three and one-half grains by hypodermic injections, that much larger doses may be taken into the stomach or injected into the urethra or dropped in the eye, but the dose should not exceed five or ten grains. That much smaller amounts should be used in the nose pharynx, larynx or gums. Probably not more than one grain should be used until by repeated trials the tolerance of the patient to larger doses can be assured. Patients who have exhibited the slightest symptoms of poisoning should be watched carefully and the drug used with great caution in the future. The case of Dr. Long is a forcible reminder of the wisdom of taking this precaution.

Notwithstanding all that has been said about the purity of

the drug and the great importance of freshly prepared solutions it should not be forgotten that the drug *per se* has actively poisonous properties and has killed in smaller doses than morphine. The method of administration is of great importance. Hypodermic injections are the most dangerous. Much more so when injected about the head, face or trunk than when injected in the extremities.

When the Esmarch bandage is applied to the extremities and the circulation permitted to return slowly, much larger doses can be given. Corning's method of rubber rings to surround the field of operation on the trunk is an extension of this principle. In making hypodermic injections the needle should be pushed in deeply and gradually withdrawn, and the solutions forced out slowly so that if a vein should be punctured it would be possible for only a small portion to enter the circulation at once.

As to the treatment of cocaine poisoning, I have nothing new to offer. There is no physiological antidote and we must be contented to meet the symptoms as they arise. Probably nitrite of amyl has been used more frequently than any other drug and for the conditions of collapse there is probably nothing better. But in most cases the heart continues to beat long after the respiration has ceased, and it seems to me that the importance of artificial respiration long and persistently employed has scarcely received enough consideration.

In cases of convulsions I should not hesitate to use inhalations of ether cautiously, I have used small doses of morphine hypodermically to control the delirium in mild cases of poisoning with good results. I am not sure but that this remedy might be used with benefit in all cases.

In conclusion I do not wish to be looked upon as an alarmist and I would not upon any consideration advise you to use this most valuable remedy less frequently, in fact I think that it should have a much wider scope and replace general anæsthetics in almost all minor surgical operations and even in some of the major ones.

Only a few days since, I enucleated an eye under the influ-

ence of cocaine for a patient suffering from a serious heart disease, bad kidneys and ascites, to whom it was thought unsafe to administer a general anæsthetic. The patient suffered very little pain and no untoward symptoms were manifest.

Dr. J. B. Matison of Brooklyn, N. Y. has contributed a number of valuable papers to this subject.

CORRESPONDENCE.

Editor AMERICAN JOURNAL OF OPHTHALMOLOGY.—In the report of the proceedings of the Ophthalmic Section of the Pan-American Medical Congress on the subject, "Muscular Errors," in the September number of the AMERICAN JOURNAL OF OPHTHALMOLOGY, I am made to say that I had seen the most happy results from "graduated tenotomies." *Complete tendon section* should be substituted for graduated. I have never made a partial section of an eye muscle and therefore have no personal experience in this surgical procedure. Nor had I been favorably impressed with the results of cases seeking my advice after operation of partial sections by other surgeons.

Baltimore, Oct. 13, 1893.

JULIAN J. CHISOLM, M.D.

Editor AMERICAN JOURNAL OF OPHTHALMOLOGY.—Authors of papers read at medical conventions, realizing the difficulties under which reporters sometimes labor, are, I think, content to make allowances for misinterpretations of their views which sometimes appear in the printed reports. When, however, the report is essentially and radically at variance with the author's statements it is due to the readers of the journal that attention should be called to the errors.

The writer of the report of the discussion on heterophoria, at the Pan-American Medical Congress, which appears in your issue for September, has so far misapprehended my remarks as to attribute to me views and practices so widely divergent from the views entertained, or the methods practiced by me, that I trust you will permit me to call attention to at least two statements of the report.

I am reported as saying "that muscular errors could be best detected and treated without correcting the errors of refraction."

As I am now, and have for years been in the daily, I might say hourly, practice, during my ordinary work in my profession, of prescribing lenses for the correction of refractive errors in cases which I am also treating for muscular difficulties, such a statement would not have been consistent with my belief and practice and I did not make the statement.

Your report also credits me with saying "that when a patient enters his (Dr. Stevens') office he immediately recognizes the character of his heterophoria."

While I have devoted a good deal of attention and labor to the study of the relations between heterophoria and facial expressions I have never indulged the hope even of attaining to such a consummate degree of skill in physiognomy as to be able to do what your report credits me with claiming and that is not the idea which was intended to be conveyed in my paper.

New York, Oct. 14, 1893. GEORGE T. STEVENS, M.D.

SELECTIONS.

ASTHENOPIA AND OCULAR HEADACHE.

BY F. R. CROSS, F.R.C.S., ENG., M.B., LOND.,

Ophthalmic Surgeon to the Bristol Royal Infirmary, and Surgeon to the
British Eye Hospital.

The term Asthenopia is applied to eyesight which is easily fatigued, the essential symptom being discomfort in the eyeball, as the result of continuous or even of very moderate eye-work. It is most commonly caused by looking at near objects, especially under faulty artificial illumination; but it is very frequently brought on by gazing continuously at a distance, as in watching a cricket match, or at a theater or picture-gallery. The strain of fatigue often expresses itself outside the eyeball as neuralgia (retro-ocular, supra-orbital, temporal, etc.), and it may cause headache to which the term Ocular Headache has been applied. The headache which is associated with eyestrain is usually located across the forehead, close over the eyebrows. It is frequently one-sided where astigmatism exists in the adjoining eye, and I have then often noticed that it is referred to the anterior portion of the temporal ridge. The pain may be occipital, especially where amblyopia co-exists or there is intra-ocular congestion, but in my experience it is but rarely vortical.

A consideration of this subject is of interest to every practitioner, no less than to the oculist. Any facts which can throw light upon the causation of complaints so common as neuralgia and headache, or which may suggest any plans of treat-

ment likely to help our patients who are suffering from those depressing and obstinate maladies will be a general gain to medical knowledge. On the other hand, it cannot be too widely understood what serious discomforts are being caused by the overpressure of eyes and brain, which seems to be a necessary factor in the education of the present day.

For the purposes of this paper, we may divide ocular neuralgia and headache into two classes:

1. In which the symptom depends mainly upon some nervous peculiarity of the patient.
2. In which the cause lies in the eyeball or in its muscular apparatus.

CLASS I.—It will very rarely occur that the eye and its appendages are absolutely normal, yet a neurasthenic condition of the system may be the essential factor in the case, and judicious constitutional treatment the sole means of cure.

In irritable, hysterical, or hypochondriacal patients, especially in those whose eyes are unduly worked—for instance, pupil-teachers, who study for long hours in addition to their duties, bootmakers, seamstresses, and clerks,—symptoms of heaviness and irritability of the eyes, dazzlings under moderate illumination, and failure of sight, are often complained of.

Some of these cases depend on extreme hyperæsthesia of the retina, or of the ophthalmic division of the fifth nerve, the result possibly of former inflammation in the cornea, of which no record may be seen; some, on weakness of the ciliary muscle.

Where there is unstable equilibrium or undue irritability or tendency to exhaustion of the central nervous system, or of the ocular or orbital nerves, symptoms of asthenopia, fatigue, temporary amblyopia, and contraction of the fields may be readily induced; and these symptoms are specially liable to occur under reflex excitation from the nasal and dental branches of the fifth nerve. They have been attributed as reflex phenomena to abnormal conditions of the uterus and ovaries, and even of the intestines.

Conversely in migraine the symptoms are expressed through

the fifth and other sensory nerve fibres of the meninges, and through the vagi and sympathetic; but these may be the efferent nerve channels in reflex action, of which the primary afferent impulse starts from irritation of nerve filaments in the eyeball.

In patients liable to headache—the tendency to headache existing even under favorable conditions—it may be induced or exaggerated by eyestrain, a proper correction of which may establish the balance in favor of comfort. Dr. G. M. Gould¹ states that of fifteen hundred cases of headache upwards of seventy-five per cent., and of sick headaches ninety-five per cent., were due to eyestrain. This proportion is largely in excess of my own experience, but no one any longer doubts the extreme importance of careful testing and examination of the eyes in headache.

There is, in my opinion, a typical form of asthenopia, of which I have not seen any account, found in young women who do not show any symptoms of hysteria. The eyes easily tire, and tend to flush and feel hot; there is no impairment of the field of vision, and the refractive error varies, but in many cases is scarcely appreciable, whilst its correction makes but little difference to the symptoms. The essential element is a tendency to active hyperemia of the face and neck, increased by hot rooms, excitement or study, with, on the other hand, coldness of the hands and feet; in these patients, inquiry must be directed to a better balance of the circulation, and its vasomotor nerve control, as well as to the condition of the generative and digestive organs.

I think that severe asthenopia is more common in young boys than in girls of the same age, partly perhaps because their studies are more rigorously enforced.

The following case, which has been under my occasional observation for seven years, shows the trouble that may be caused by the idiosyncrasy of the patient after slight inflammation:

¹Oph. Rev., vol. x, p. 280.

Basil R., seven years old, came on January 4, 1886, with slight internal squint of the left eye. The eye was very amblyopic, 20 J.; the sight in it was not sufficient to avoid obstacles in progression. Hypermetropia not more than 1 D. The right eye was emmetropic and had perfect sight. After a few months' practice with the left eye, its vision improved to $\frac{6}{x_{11}}$ 1 J.; and later it reached $\frac{6}{ix}$, where it has remained ever since. He has always seen better without any glasses, even for reading. He was unable to study severely, but went on well, the squint gradually disappearing, until, in May, 1890, he had a slight attack of ophthalmia, which was soon cured; there was no evidence of implication of the cornea, and no follicular swelling remained. From this time, however, any attempt to use his eyes produced lachrymation and headache. His studies were curtailed, but he could not manage them on account of asthenopia. There was no further impairment of the sight, nor could any form of help by spectacles afford relief; he became very excitable, and walked in his sleep. After a short rest in the country he returned apparently well, but broke down again on resuming moderate work. After a full term's rest, he was able to do his lessons in school, his preparation in the evening being done for him. In the beginning of 1892 he completely broke down again—photophobia, lachrymation, and headache,—although his central and peripheral vision remained perfect. Every chance had been given him by his college masters, but I felt obliged to recommend that he should abandon public school life, and be content with a tutor at the seaside. He appeared for two years to have completely recovered, but has recently had a recurrence of his asthenopia independent of any apparent cause.

There is need of a good school where individual attention could be given to boys with asthenopia, progressive myopia, slight zonular cataract, etc., who should not be allowed to attempt the full curriculum of public school studies. For such scholars the aspect and dimensions of the school windows and the method of artificial illumination should be perfect, the seats

and desks should be carefully applied, and the amount of reading limited.

Many children come to the hospital complaining of eye-ache and defective vision ($\frac{5}{1}$ _{XVIII} or $\frac{5}{1}$ _{XXIV}), who completely recover with no other treatment than a few weeks' rest; these are cases of ciliary or retinal fatigue, induced by an amount of school work which the children, from some crisis in development or health, are temporarily unable to master. Other types of asthenopia which depend upon some defective conditions in the general health of the patient might be alluded to.

CLASS II.—The very large majority of the cases of asthenopia depend on faulty conditions in the mechanism of the eye itself, and should be included in a class which comprises errors of refraction and abnormalities of the intrinsic and extrinsic ocular muscles, under the divisions of Accommodative and Muscular Asthenopia.

(A) *Accommodative Asthenopia* is the form which is associated particularly with abnormal conditions of the ciliary muscle and with errors of refraction. This division of the subject is very well understood; so much so, that even some medical men seem to consider that an optician's advice as to spectacles is quite sufficient, and fully capable of assisting to cure their patients. Thus encouragement is being constantly given to a form of counter-prescribing which is not creditable to the doctor, nor beneficial to the patient, nor advantageous to the optician, who would still sell his spectacles, if the doctor himself had prescribed them. Those of us who have the greatest experience in dealing with astigmatism or muscular deficiencies know best how difficult it often is to decide what lenses are the most suitable. In an uncomplicated presbyopia there is perhaps no need for a scientific opinion in the selection of glasses. But the reason why a child's sight is deficient or painful, or that of an adult differs from the normal standard in degree or competence, is a problem for solution by medical knowledge.

Donders wrote of asthenopia as a "peculiar morbid condition of the eyes which has long attracted the attention of oph-

thalmologists. The phenomena of which it is composed are highly characteristic. The eye has a perfectly normal appearance; its movements are undisturbed, the convergence of the visual lines presents no difficulty, the power of vision is usually acute, and nevertheless in reading, writing, and other close work, especially by artificial light, or in a gloomy place, the objects after a short time become indistinct and confused, and a feeling of fatigue and tension come on in, and especially above, the eyes, necessitating a suspension of work."

The emmetropic eye sees at a distance in a state of rest, and its full complement of accommodation is available for closer vision; the hypermetrope, on the other hand, is obliged to tax his accommodation under all conditions where clear vision is required; his focussing muscle is therefore scarcely ever at rest, and when he requires to see more closely only a portion of its normal energy is available. The undue strain may be overcome during youth and health; but as the power of accommodation lessens with age, and particularly under conditions of excessive eyework or of illness or faulty illumination, neuralgia and headache are produced, and the sight fails. It is more than thirty years ago that Donders completely solved the problem of "accommodative asthenopia" and "ciliary strain."² His statement that hypermetropia is usually at the bottom of asthenopia remains unchallenged, if we include hypermetropic astigmatism. Still asthenopia may depend upon any condition of refractive error; and this cause is almost universal, for it is only a very small number of eyes that are perfectly emmetropic.

I think that a very large percentage of cases of astigmatism is associated with neuralgia and headache, and that very small degrees of error in curvature of the cornea often give rise to more discomfort than is found in cases where the astigmatic error is more marked. If this be so, it is of prime importance that astigmatic defects should be accurately neutralized, and

²On the Anomalies of Accommodation and Refraction of the Eye. New Syd. Soc. 1864.

this can only be done by careful objective testing, as by retinoscopy and the ophthalmometer. No doubt a considerable number of asthenopic patients are wearing with relief spectacles that do not properly neutralize the defect from which they are suffering; on the contrary, there are many others who receive no benefit from partial or inaccurate correction, and in all cases it is necessary to adopt a more scientific method than the subjective one by which the optician aids the patient to select lenses for himself.

Conditions of the ciliary muscle require consideration: presbyopia is the simplest form; fatigue or paralysis of accommodation may occur, notably after diphtheria, in eyes that are otherwise healthy. Insufficiency of the ciliary muscles has been described as a congenital defect,³ and it may accompany ill-health, at which time asthenopic neuralgia is not infrequently caused by injudicious reading.

Spasm of accommodation is not very uncommon in overworked children; by its simulation of shortsight, it is a prolific source of deception in the selection of spectacles by subjective testing. The error caused is almost always spherical. Astigmatism from ciliary spasm I believe to be very rare. For the purposes of a paper on "Retinoscopy,"⁴ I examined a large number of eyes by the shadow test and by lenses, both before and after the instillation of atropine; in only a very small number was any change produced in the amount of astigmatic error or by the use of the atropine, while the presence of a latent spherical defect was of course frequently shown.

Accommodative asthenopia is caused by an intra-ocular condition which must be sought for in each separate eye; very common in hypermetropia, it may also be present in low degrees of myopia and in myopic astigmatism. The discomforts of short-sight, however, usually depend upon the strain due to inaccurate performance of the act of binocular vision, as controlled by the extrinsic muscles of the eyeball, and constitute one of the forms of (B) *Muscular Asthenopia*.

³Theobald, Trans. Am. Opt. Soc.

⁴Trans. Intern. Med. Cong., 1887.

The best recognized example of this binocular defect is insufficiency of convergence, for in myopia the required amount of convergence is always relatively greater than that of accommodation; while hypermetropia, on the contrary, calls for more accommodation than convergence: and as hypermetropia induces both ciliary failure and ciliary spasm, so in myopia we find insufficiency of the internal recti usually, but sometimes a state of internal strabismus due to continuous overstimulation of these muscles. Treatment consists in the correction of the relative amplitudes of accommodation and convergence by the use of concave spectacles, with, in some cases, the addition of prisms.

Besides the excess of convergence in hypermetropia and the excess of divergence in myopia, which may culminate respectively in internal and external strabismus, there are all sorts of other faulty tendencies in the ocular muscles, causing neuralgias and eye-aches, which are grouped under the term of muscular asthenopia.

The defects that cause these symptoms may be present in the muscles in their insertions, in the nerves supplying them, or in the central nervous system. The discomfort depends upon the instinctive adherence to binocular vision, and the undue effort necessary under faulty conditions to maintain it. Thus, as Donder's pointed out, if, while both eyes of some hypermetropes are fixing an object, one be shielded by the hand, the covered eye will rapidly deviate inwards, and conversely, by the same method many myopes, who maintain binocular vision, are shown to have a tendency to divergence, which increases with approximation of the object. In squint and diplopia a faulty position of the eyes is sufficiently obvious; and in cases of monocular amblyopia, where the good eye is alone relied upon for sight, the blurred retinal impression from the other is disregarded, the necessity for binocular vision ceases, and the faulty eye wanders according to its muscular balance.

This tendency to deviation may also exist in eyes with good vision, whether emmetropic or aided by spectacles, but here

the effort for binocular vision is usually sufficient to maintain the proper direction of the visual axes, even if muscular asthenopia be thereby induced. If a latent faulty tendency in the muscle balance be suspected, it can be made manifest by rendering one eye amblyopic. For this purpose a strong concave or convex lens, with a stenopæic hole to prevent prismatic action, may be used to blur the image of a lighted candle placed at six metres. A ball of light is seen with one eye, the candle flame with the other; and the relative position of the two as projected by the patient indicates the position of the visual axes. Several methods of reaching the same result have been suggested.

For measuring the statical equilibrium of the eyes, the test must always be made with a distant object—five metres at least,—so that the element of accommodation may be eliminated. For measurements at occupation distance, or for reading, where accommodation and active convergence are called into play, Graefe's test, with the dotted line and vertical prism, has been elaborated by Maddox, who also has given us the glass rod test,⁵ so useful in all forms of latent deviation. Moreover, diplopia can always be induced by the use of prisms, and by their means the power of abduction or adduction, or other movements of a pair of eyes, can be approximately tested. The vertical deviation is weak and usually limited to overcoming a prism of 4° or 2° , whilst abduction overcomes 7° or 8° , and adduction is much more powerful.

George Stevens⁶ has done much by his work and writings to stimulate our inquiries as to "Anomalies of the Ocular Muscles," and has introduced terms which indicate precisely the special tendency or latent deviation in a given case. In *esophoria* and *exophoria* the eye tends respectively to turn in or out, while if the deviation is up or down *hyperphoria* is present.

I am now in the habit of seeking for latent errors in the ex-

⁵Oph. Rev., vol. ix, p. 129.

⁶New York, 1887.

trinsic ocular muscles of many of my patients. Such defects are not very common, but in some cases faulty balance undoubtedly exists, and in such, decentring of the lenses (where ametropia is present) or the use of prisms has relieved the muscular asthenopia.

The value of abducting prisms is well recognized, but I have some half-dozen patients with hyperphoria who wear with comfort vertical prisms. In these cases the essential of treatment lies in orthoptic exercises and the stereoscope. Extravagant statements have been made, particularly by American writers, as to the dependence, not only of asthenopia and headache, but of chorea, epilepsy, and of all kinds of functional nervous diseases upon these ocular defects. It is suggested that cures of the nerve disease in some cases can be brought about by rectifying the defects of equilibrium in the eye by prismatic lenses, by operations on the recti tendons—graduated tenotomies and partial advancements; on the other hand, among the opponents of these enthusiasts (who, to quote Donders' criticism of Bonnet and Pétrequin—1841,—“are too much preoccupied with the idea of tenotomy”) are some who question the entity of muscular asthenopia as distinct from errors of refraction, and entirely deny that ocular derangements can be the cause of nervous disease.

A few cases have been published of epilepsy cured after the use of spectacles. One such case has occurred in my own experience, but I scarcely like to claim the cure as more than a coincidence:

G. R., æt. 21, a very energetic man, six feet three inches in height suffered from attacks of petit mal, accompanied by headache, diplopia, and peculiar yellow vision, usually occurring about dinner-time. He complained of slight crossed diplopia, which was corrected by a prism 1° base in, while a prism 3° base in gave him homonymous diplopia.

R. $\frac{5}{12}$ J 1 — 1 cyl. $> 30^{\circ}$ down in $\frac{5}{5}$.

L. $\frac{5}{16}$ —.50 cyl. down and in $< 60^{\circ}$ $\frac{5}{5}$.

He was fond of reading, and felt no discomfort from it, but he could write for only a short time. He was ordered the

cylinders mentioned, to be worn constantly, and happens to have had no fit since.

I made no effort to correct his very weak power of adduction and abduction, which might have been due to hyperphoria (of the existence of which I was at that time ignorant). If spectacles were of value in this case, it was by correction only of the astigmatism.

The following case of faulty muscular balance—mainly hyperphoria—well illustrates this defect and the method of its detection:

C. S., a fine, healthy man of 24, has never been able to use binocularly any race or opera glass. To see through them necessitates the closing of one eye; he never uses them.

For two or three years he has at times noticed that the pictures on his bedroom wall are a little doubled when he wakes in the morning. He had not noticed any discomfort from double vision during the day, but has found that he can sometimes voluntarily get a double image. For some months, when tired, he has had slight difficulty in reading; the lines tend to become doubled one above another, and unsteady: this is at once relieved by closing either eye, and his friends have noticed that he has got into the habit of putting his hand involuntarily to his left eye when he is tired of reading.

Vision: R. $\frac{6}{VI}$ emmetropic.

L. $\frac{6}{VIII}$ - .50 cyl. " 6.

Has been given + .50 readers, which are no help. Asthenopia is at times definite, but never severe.

Testing him with a candle at six metres, with a red glass over one eye, no diplopia could be elicited; but single vision was upset by a prism 9° apex in, or 4° apex out, showing marked weakness both of adduction and abduction. Whereas the movements of the right eye upward, and of the left down, were usually powerful, single vision being maintained with a prism 5° apex up on the right and 4° down on the left, and a prism of 3° in the same positions gave a feeling of relief to the strain felt when the eyes were unaided; on the other hand,

double vision was at once produced by a weak prism 1° apex down over the right, or apex up over the left.

The patient looking at a candle flame at six metres distance with a strong lens and stenopæic opening over the right eye, the blurred image seen was below and to the right of the candle seen naturally with the left eye.

Maddox's rod placed horizontally over the right eye, gives that eye the impression of a vertical line of light (in orthophoria the light line and candle should overlap). In C.S. the streak wandered about 30 cm. to the right, showing that the eye was turning inwards (esophoria). A 5° prism, apex in, corrected the abnormality. When the glass rod is placed vertically, it gives the impression of a horizontal bar of light; thus placed over the right eye, the bar of light deviated to the base of the candle-stick, showing that the eye had wandered upwards; placing the bar over the left eye, the converse obtained—the bar was projected upwards by passive deviation of the eyeball downwards.

The faulty tendency was rather more marked when the right eye was rendered amblyopic than the left; so that while a prism apex down 6° corrected the left, a prism apex up of 8° was required to correct the right.

Although no diplopia could be made manifest without the use of prisms, or by some method by which the vision of one of the eyes was rendered indistinct, the patient at once derived great comfort from placing a 3° or 4° prism apex up over the right eye, and with the same lens read quite comfortably.

The asthenopia has been corrected by spectacles:

R. Prism 2° apex up.

L. $+ .50$ cyl.

A prism of 4° was to be used vertically wrong ways, so as to exaggerate the diplopia and thus stimulate the faulty muscles, and the stereoscope was prescribed for orthoptic exercise.

A recent paper by Dr. H. F. Hansell on "The Prominent

Symptoms of Hyperphoria, as Illustrated by Thirteen Consecutive Cases," indicates the importance of enquiring into the conditions of the muscular equilibrium of the eyeballs. In the cases described all causes of discomfort, at any rate all ocular defects, excepting the muscular anomaly named, are said to have been excluded. The symptoms complained of by the patients were asthenopia, lachrymation, photophobia, headache, in some cases attended by vomiting, vertigo, dizziness, dyspepsia, nervousness; irritability of temper, mental confusion. These varied types of abnormal conditions are said to have been relieved by curing the hyperphoria, either by tenotomy or by the use of prisms.—*Bristol Medico-Chirurgical Journal*.

A SYPHILITIC GUMMA OF UPPER EYELID RESEMBLING A DISLOCATED LACHRYMAL GLAND.¹

BY W. A. FISHER, M.D., CHICAGO.

Miss P., age sixteen, appeared in my clinic, Illinois Charity Eye and Ear Infirmary, September 24, 1892, with interstitial keratitis right eye. Patient has always been healthy except, her mother says, "had scrofula when a baby, lasting until she was six years old," the eruption appearing only on head, face and neck. Father and mother healthy; three children living, youngest three years, oldest eighteen years, all healthy; eight dead,—one typhoid fever, three diphtheria, one pertussis, one pneumonia, one drowned, one miscarriage. No specific history in parents or patient except as mentioned above. Ordered:

R Atropin. Sulph., - - - - gr. ij.
 Aq Dist., - - - - - ʒj.
 M.

¹Read before the Chicago Ophthalmological Society, April, 1893.

Sig.: Gtts. ii. in right eye; t. d. Internally increasing doses of pot. iodide.

Patient gradually improved until October 20, 1892, when she noticed a growth in upper eyelid coming on suddenly and interfering with movements of the eye. On examining the tumor, found it to be freely movable and it could easily be pushed up, "seemingly" into the lachrymal fossa, where it would remain until forcibly closing the eye, when it would reappear in the upper eyelid. It was a most interesting growth and diagnosed as a dislocated lachrymal gland, with a question mark. I then had all the men on duty that day, and a number of visiting doctors examine the eye. Some were quite positive it was a dislocated lachrymal gland; others not venturing an opinion. She was given the benefit of the doubt, growth replaced, put on pressure bandage and continued pot. iodide. The eye became more irritable, the growth making it more irritable than it would otherwise have been. From October 20, 1892, to January 1893, many prominent oculists of this society saw her. I persisted with pot. iodide but thought I had a rare case of dislocated lachrymal gland. Some of my friends were bold enough to say it could not be anything but a dislocated lachrymal gland. While I was treating her she naturally became impatient, not seeing any improvement, and consulted two of our oculists. But when they proposed an operation she timidly returned to me and possibly saved the profession of a report of one more case of dislocated lachrymal gland. At our January meeting I intended showing her to the society and then removing the growth, for at that time it had not decreased any in size, and the patient would be better off without it, no matter what the growth was, for it was producing a great deal of irritation. But she was out of the city at that time and thus saved herself the trouble of an operation. When I saw her again, about four weeks after, the growth was nearly gone. There has been no trace of it now for about a month, and the interstitial keratitis has entirely disappeared. The patient has been very irregular in her attendance at the clinic and for fear she would not be in reach when I wanted her I have had a

good number of the society see her when the growth was at its height and several of you have seen her since it has all disappeared. Patient says she has been taking the medicine according to directions all the time. The old adage being true, "especially of hospital patients," operate them when you have a chance or they will get away. In looking up the literature of dislocated lachrymal gland I find only four reported—one a patient of Jaeger's who had a similar history as this one; patient had interstitial keratitis for four weeks accompanied by protrusion of lachrymal gland, treated for five weeks, no improvement, cut down on tumor, made section and on examination found to be gland, pressed gland in position, put on pressure bandage, and with inflammation caused by the cutting, gland remained in position.

Another, a case of Snell's, was complicated with naevus of forehead and seemed to pass into the orbit. Patient, a hard drinker, during a fit of coughing, dislocated the lachrymal gland. It was replaced with the finger and remained in position. Another, caused by caries of the orbit. Noyes reports one differing from any of the others, it coming on gradually, the patient being nine years old when he saw and removed it. In conclusion will say this growth was a specific gumma, and as gummas in this region are rare this case has seemed to me to be worth reporting. The growth may have come on slowly, she not noticing it at first. She might have taken medicine at first that was inert, or she may not have taken it at all. It at least shows us that growths of this kind should have persistent treatment.—*Jour. Am. Med. Assn.*

REVIEWS.

DIE AUGENAERZTLICHEN OPERATIONEN (THE OPERATIONS ON THE EYE). By VON DR. WILHELM CZERMAK, Wien, Carl Gerold's, Sohn. 1893. Second Part, two marks. Third Part, four marks.

Czermak's work, as far as it is published—the first part has never reached us—is surely a very valuable addition to ophthalmic literature. The numbers received treat exhaustively on all the methods of operating, known or of value, on the lids, conjunctiva and lachrymal apparatus. The reading of these chapters is made especially profitable and enjoyable by the large number of excellent drawings. We await the further numbers with the confidence, that they will be equally enjoyable and useful. The printing is excellent.

A TEXT-BOOK OF OPHTHALMOLOGY. By W. F. NORRIS, A.M., M.D., and CH. A. OLIVER, A.M., M.D. Illustrated with Five Colored Plates and 357 Wood Cuts. Philadelphia: Lea Brothers & Co. 1893. Cloth, \$5.00; Leather, \$6.00.

This exhaustive treatise of six hundred and forty-one pages cannot fail to be largely appreciated. The work has been divided between the two well-known authors in such a manner that the first part, including anatomy, physiology, optics and functional examination have been written by Oliver, while Norris has treated upon the pathology and therapeutics of the eye and its surroundings. The large experience and thorough knowledge of the literature of the authors combined with a great deal of their own personal observation give this book a place among the best on the subject. ALT.

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ORIGINAL ARTICLES.

A SERIES OF OCULAR TUMORS PRESENTING SPECIAL POINTS OF INTEREST.

BY ADOLF ALT, M.D.

In the February number, 1889, of this journal, I published a number of *congenital* tumors, which I had operated upon. Among a larger number of congenital ocular tumors which I have since seen, the following two only are, perhaps, of more than common interest.

CASE I.—E. M., a white boy, nine years of age, was brought to my office on account of asthenopia due to some refractive error, January 24, 1893. Aside from this he had a "birthmark" on the right eye, which his mother liked to have removed. I found a yellowish-brown spot situated in the bulbar conjunctiva up and inwards, slightly raised over the surrounding surface and irregular in outline. Its size was about ten millimeters by four millimeters. I removed the little tumor with scissors and healing took place in a few days.

On microscopical examination it was found that the whole tissue beneath the epithelial layer consisted of large round

cells, filled with pigment granules to a varying degree. There was but very little intercellular substance and no connective tissue. No bloodvessel traversed the area of the little tumor.

This was then a *simple melanoma conjunctivæ*.

CASE II.—On November 16, 1889, L. M., a little girl, four months old, was brought to me by her parents who had noticed at once after birth a little yellow protrusion in the outer corner of the right eye. They were certain that this protrusion had been continually and slowly growing towards the cornea. The eye was held in a convergent position.

I found a yellow tumor with a smooth surface, which protruded from the outer canthus and, covering the sclerotic, had almost reached the corneal periphery in its growth. It was covered by the conjunctiva which was slightly hyperæmic and it could be moved to and fro to a certain extent upon the sclerotic. How far it might reach back into the orbit could at this examination not be made out.

When I advised the removal of this unsightly growth the parents at once consented. The operation was performed with general anæsthesia and presented no difficulty whatever. The tumor did not reach far into the orbit and was enclosed in a connective tissue capsule of its own in which I easily took it out as a whole. Several larger bloodvessels entered into this capsule, which bled profusely and an after-hæmorrhage took place during the following night, which I succeeded, however, quickly in bringing to a standstill by digital compression.

The tumor had the shape of a medium-sized chestnut, the thicker end corresponding to its orbital portion, while the thinner end lay near the cornea. It proved to consist solely of fat-tissue, and was, therefore, a pure *congenital lipoma*.

The following are cases of tumors which have grown in adult life, which either in their history, or in their clinical, or histological aspect are outside of the ordinary experience.

CASE III.—B. E. L., a mechanic, aged forty-six years, came to me on account of a disfiguring swelling of the left lower lid. He had noticed its slow growth for five years and attributed

its beginning to the fact, that he rubbed his eye very often with a dirty hand.

I found the inner third of that lid occupied by numerous roundish nodules, looking something like xanthelasmata. They varied considerably in size, the two or three largest ones were of the size of a pea. Some of these nodules were pitted. They felt hard, like epitheliomatous tissue. There was ectropium and the exposed conjunctiva was swollen considerably. The stillicidium and the increased itching and pain had brought the somewhat cowardly man to seek help. Although I intended to close the gap resulting from the removal of the portion of the lid which was the seat of the tumor by a larger plastic operation, he would not consent to it, as it would keep him from work too long. I, therefore, tried to simply close the gap and succeeded in doing it with some difficulty, after having performed canthotomy. In spite of the considerable strain on the sutures, only the one nearest the lid-margin gave way. During the healing process, however, the little coloboma resulting from this, flattened out to such an extent, that barely a little notch remained visible and the tears did not run over.

Although the aspect of the lid was not exactly that of an epitheliomatous lid, I thought, that it would after all prove to be affected with epithelioma. The histological examination, however, showed that this was not the case.

The epithelial coat was in places enormously thickened, in others less so. The subcutaneous tissue was highly infiltrated with round cells, but the bulk of the tissue of the lid was made up of glandular tissue, resembling the acinous type. Dozens and dozens of such glandular tubules were crowded together into a lobule, so to speak, separated from the adjoining ones by a thin septum of connective tissue which in places and especially along the enclosed bloodvessels is considerably infiltrated with round cells. This adenomatous tissue lies between the skin and the tarsal tissue. The Meibomian glands seem unaltered, although the tissue between them, too, is crowded with round cells. From the foregoing this tumor must be considered to be an *adenocarcinoma of the eyelid*.

CASE IV.—N. R., aged twenty years, a very fleshy, but otherwise healthy girl, came to consult me in March, 1892, on account of excruciating pains in the right orbit, starting from the outer canthus of the right eye and running back into the orbit and upwards on the forehead. These pains were almost uninterrupted and kept her from sleeping. There was a slight degree of convergence and she saw sometimes double. The optic nerve was anæmic with correction was $^{20}_{XL}$. During the following months, the pain remaining a constant and unyielding symptom and being always referred to the same place, I made an exploratory operation at the outer canthus and removed what I thought to be the hypertrophic palpebral lachrymal gland. On examination this proved to be correct, but the tissue between and surrounding the acini of glandular structure was highly infiltrated. A few days of rest followed the operation, but then the pain again came on. At this period the patient disappeared from my office. When I saw her again in June, there was continued blepharospasmus of the right side with profuse lachrymation whenever an attempt was made to open the eye. When separating the lids a small nodular tumor protruded into the conjunctival sac at the outer canthus. Vision was reduced to $^{20}_{cc}$?, the optic nerve was very anæmic and there was decided convergence of the right eye. On June 17, I removed this tumor under chloroform. It was about the size of a small bean and consisted almost solely of glandular structure surrounded by highly hyperæmic and infiltrated tissue. This operation was followed by a general improvement of the existing conditions, particularly the pain. This improvement, however, did not last long and all the symptoms returned with renewed fury. The patient and her family begged me to remove the eye, to which I did not at that time consent. In October the patient returned to me. She said, that if I did not remove the eye, she would die. She had had no night's rest for many months without an anodyne, and, even the rest so obtained was broken and insufficient. She had lost twenty pounds of flesh since I saw her last. There was now some exophthalmus inward and downward. Vision re-

duced to fingers at 4"; beginning atrophy of the optic nerve. On palpation a roundish, hard tumor could be felt behind the outer upper margin of the orbit, evidently reaching farther back than I could feel. As I did not think I could get the tumor out fully, I first enucleated the eyeball. After its removal two distinct tumors could be palpated, one about the size of a large hazelnut lay right underneath the capsule of the orbital lachrymal gland and a smaller one somewhat farther back in the orbit. Both tumors were removed with scissors. The orbital lachrymal gland did not appear altered and was left untouched. Absolute euphoria followed the removal of these tumors and lasted for about three months. Then the pain returned, but is located in the right frontal region. The patient is losing appetite and flesh and no treatment seems to relieve her. No local relapse of the tumor has occurred.

The tumors like the smaller one removed in June consist in the main of lobules of acinous glandular tissue closely packed and surrounded by highly hyperæmic and infiltrated connective tissue.

This then is a case of *adeno-carcinoma of the palpebral lachrymal gland*, and seems to be unique.

CASE V.—J. D. T., aged fifty-eight years, consulted me in July, 1890, on account of his right eye. About nine months previously he had noticed double vision and for three months he noticed that this eyeball protruded more and more. I found a moderate exophthalmus in an inward and upward direction. The movements of the eyeball were restricted outward outward and upward, and outward and downward. V= $\frac{1}{2}$ cc. Atrophy of optic nerve. A semi-soft round tumor could be felt in the region of the lachrymal gland, reaching downwards to some extent.

After incising the conjunctiva over the tumor this was found to be enclosed in a tense fibrous capsule, evidently the distended capsule of the lachrymal gland. In the attempt to dislodge the whole tumor out of the fossa lachrymalis the capsule burst and the contents came out piecemeal before the whole sac was removed.

The tumor was a *typical myxo-sarcoma of the lachrymal gland*. Not a trace of glandular tissue could be found in numerous sections.

CASE VI.—H. D., aged fifty-three years, consulted me on account of a gradual failing of vision particularly in the left eye, on September 9, 1887. I found vision right normal, vision left $\frac{20}{XL}$?. Could read only Sn. VI with glasses correcting his presbyopia. I found anæmia of the optic nerve and retina, especially in the left eye. The patient was an excessive smoker and finding no other pathological change to account for the reduced visual acuity, I enjoined abstinence from smoking and alcohol and gave him strychnia.

On September 27 he had Left vision $\frac{20}{XXX}$ and could read Sn. III. He expressed himself as greatly improved. Ophthalmoscopically no change was visible.

On November 13 he returned, stating, that within a week his left eye had grown considerably worse, and that he had some pain in it. V. = $\frac{20}{CC}$. After dilatation of the pupil the retina could be seen floating behind the equator of the lens, in an outward direction. The intraocular tension being, if anything, higher than normal, surely not less, I told him that although this might be a simple detachment of the retina, it might be caused by an intraocular tumor. As I did, however, not feel justified in stating this to be a fact without doubt, he wanted me to see, whether treatment would not cure it. Two week's treatment with pilocarpine, recumbent posture and compressive bandage, produced no alteration of the condition of the eye; and the patient left me, with the injunction to report any noticeable change.

On February 2; 1888, I was telegraphed for to see the patient. He had had excruciating pains in the, now blind, eye for a week. I found a great deal of swelling of the lids and chemosis. The cornea was hazy, there was no anterior chamber, the cataractous lens lying close to the posterior surface of the cornea. + T2. He submitted at once to enucleation.

The tumor filled only a comparatively small part of the eye and concerned chiefly the ciliary body and the adjacent chori-

oidea. It was a *mixed pigmented sarcoma*, consisting of *round and spindle-cells*.

CASE VII.—J. B., aged seventy years, came to see me on account of blindness and pain in the left eye on September 11, 1893. Eight months previously he had noticed a cloud come suddenly over his vision from above and "vision was trembling." This was soon followed by photopsiæ. Detachment of the retina being diagnosed by the attending oculist, he submitted to six weeks of treatment by pilocarpine, rest, etc., under which, he states, he grew daily worse. Three weeks previous to his visit to my office, the eyeball had suddenly become very painful.

I found some ciliary injection. The pupil was wide, but no reflex could be obtained from the fundus. + T 2. V.=0.

The diagnosis of intra-ocular tumor was verified after the enucleation to which he promptly submitted. In this case the tumor of the size of a small hazelnut sat close to the optic nerve entrance and was in the main *an unpigmented small spindle-cell sarcoma*. In the center of its base, however, there was a portion which consisted totally of *myxomatous tissue*.

CASE VIII.—Mrs. W. B., aged thirty-three years, consulted me on March 5, 1884, on account of glaucoma chronicum inflammatorium of both eyes, particularly of the right eye. Vision was reduced to $\frac{20}{60}$ in this eye and to $\frac{20}{100}$ in the left. Iridectomy was performed in both eyes, which two years later (in 1886) was followed by a sclerotomy of the right eye. Compound hypermetropic astigmatism, against the rule, in either eye was corrected by glasses and vision thus was brought up to $\frac{20}{100}$ in the left and $\frac{20}{100}$ in the right eye. In 1891 the patient consulted me about her glass for the left eye. At that time her right eye showed glaucoma absolutum and was at times painful. The advice to have it removed was not accepted. In June, 1893, patient called on me again on account of long continued attacks of pain. There was now glaucomatous cataract and the eye bulged somewhat at the cornea-scleral scar. Enucleation was again advised and refused. Finally, on August 17, she submitted to removal of this eye.

To my astonishment I found, on opening it after a few weeks, that it contained a good-sized *pigmented round-cell sarcoma of the choroid* which was on the point of breaking throw the iridectomy scar.

CASE IX.—A. F. K., aged thirty years, when calling on me on April 4, 1888, related that six months previously his left eye had been struck by a missile from a bean shooter. There was no external wound visible at the time, although the eye was painful for several days. Two months ago, he noticed a feeling of fullness and pressure in that eye, and it soon after became painful and visibly inflamed. Vision now became rapidly abolished and gradually the eye showed a bluish black spot which protruded and occupied the locality of the original injury.

I found a blind eye with a considerable ectasia reaching from the equator to the cornea on the outer side of the eyeball. The pupil was wide, the iris discolored and, what appeared as a cyclitic membrane, was seen behind the semi-transparent lens. The eye was harder than normal and the possibility of an intraocular growth being explained to the patient, he reluctantly consented to have the eye removed.

What had appeared to be a cyclitic membrane, was a *pigmented round-cell sarcoma of the choroid*, covered by retina, which filled almost the whole of the vitreous cavity.

Although it is, of course, not certain whether this tumor did not exist before the injury, yet this is not likely, as the intelligent young man would probably have noticed something of it. It seems to me, therefore, that we have to deal with a choroidal sarcoma caused by an injury to the eyeball.

CASE X.—Mrs. E. W., aged thirty-nine years, came to see me on April 4, 1885, two years after having suddenly got blind in the right eye after witnessing a fire which consumed her husband's box-factory. From this blindness she had slowly recovered. Of late she has had attacks of considerable pain in this eye which are always accompanied by redness and swelling.

I found that the pupil was dilated and she had an eccentric

vision of 8/100. Near the optic disc, and below and outwards from it, the retina was seen to be abruptly raised for the distance of about two optic disc diameters, from where the raised tissue gradually sank to the level of the surrounding retina. At this place small pigment patches and several hæmorrhages were seen. The retinal bloodvessels passed over the raised spot.

I explained to her the likelihood of the presence of an intra-ocular tumor and after a few day's hesitation and repeated examinations, I got her consent to enucleate the eye.

A flat tumor of about four millimeters thickness was found in the choroid at the locality mentioned, to which the retina was firmly attached. It was a very vascular *semi-pigmented sarcoma consisting of round and spindle-cells*.

On August 17, of the same year, patient called on me again on account of a small pigmented point on the conjunctiva near the lachrymal caruncle. It was no larger than the head of a pin and I removed it at once. It consisted solely of pigmented round-cells. The patient has since been well.

SELECTIONS.

CASE OF THE TUMOR OF THE OPTIC THALAMUS

BY WHARTON SINKLER, M.D., PHILADELPHIA.

Miss A., æt. 46, had always enjoyed excellent health and had been of a cheerful and even temperament. Menstruation has been regular and painless until within the past year, when the flow has been excessive.

In January, 1893, the family thought she was rather dull and took less interest in things than usual, but at the time this attracted but little attention. The end of March, just after returning from a trip to Cuba, it was noticed that there was a marked tendency in the patient to be gloomy and morbid in her expressions, and she seemed to be indifferent to many things which had formerly interested her. Her manner became listless and there was a constant desire to lie down and sleep. The sleep was not light or natural, but was very heavy and deep and lasted for four or five hours at a time during the day. She complained at this time of a great deal of difficulty of vision, and went to Dr. Risley for a change in her glasses. He kindly sent me the following report:

"Miss A. came to me on March 22, complaining of the recent rapid increase of her myopia, but said that she had no pain in eyes or head. She said she had formerly suffered much from headache, but not of late, and was able to use her eyes with impunity until quite recently, and then found fatigue only after prolonged use. She complained only of her dim distant vision. With a carefully selected glass vision was one-half in each eye. The note made is as follows:

"The anterior sclera is thin, perforating vessels distended, but the ophthalmoscope shows only a small crescent at the temporal margin of both nerves and the posterior part of the eye-ground not in bad condition. Range of accommodation normal and no marked want of muscular balance.

"She received a mydriatic which was used until the twenty-ninth, when her correcting glasses were ordered, the vision having risen to normal in each eye. I have observed at the first visit an unusual slowness of speech and hesitation in calling the test letters, but not being familiar with the patient thought it possibly characteristic, as she was sluggish in all her movements, sank deeply into her chair and replied slowly to questions. In one week she returned for a reading glass, complained of some confusion of sight and that she was not feeling well. The disturbance of vision was apparently due to some hyperphoria, but it was variable and uncertain, and her vision was not quite as good as when the glasses had been ordered one week before. The field for form was normal, color field not taken. The ophthalmoscope revealed no change in the eye-ground.

"In about ten days she returned, when I was much struck by the evident rapid failure in her health, and I found that vision had sunk to one-half again, but the ophthalmoscope revealed no visible change in the fundus. It was now plain that the mental sluggishness had increased, as she was a trifle petulant and seemed averse to any effort, even to reading the test letters. She seemed to be hysterical."

She was disinclined to talk, and was averse to giving an account as to how things appeared to her. The listlessness and apathy increased from day to day, and about the middle of April the expression of the face began to show marked change and became vacant. About this time there was slight aphasia, which was only noticeable, however, to those who were constantly with her. The aphasia was not marked, and consisted merely in the occasional miscalling of a word. After a period of somnolence, which lasted two or three weeks, there came a tendency to restlessness. She walked up and down the room

a great deal and seemed slightly unsteady in her gait, occasionally taking hold of the back of a chair to support herself. When asked why she walked so much, she said that her legs felt weak and as if they would give way, and she thought that exercise would strengthen the limbs.

The next symptom observed was paresis of the right side of the face, the left corner of the mouth being drawn up in smiling and talking. Her hands seemed unable to guide themselves; for instance, she would have difficulty in lifting a cup directly to her mouth, and the inco-ordination was rather greater in the right hand than in the left. She had always been somewhat left-handed, but it now became noticeable to her friends that she used the left hand much more frequently than formerly. The use of her fingers became awkward and feeble. She could scarcely button her gloves, or even draw on the fingers, and in all small movements she showed a feebleness of the hands; for example, she could play a good game of cards, but could not shuffle the cards, and if they dropped out of her hands she either did not see them, or else made no effort to gather them up. There were never any choreic movements. The general health was fairly good, the appetite was good—if anything, unusually large for her. She sometimes complained of headache, but there was no constant headache and the pain did not appear to be very severe.

About May 1, Dr. Goodell made an examination with the view of determining the reason for the menorrhagia which had existed for several months. He found that there was a small fibroid of the uterus, but discovered no other abnormal condition. On the day that she visited Dr. Goodell's office, which was the last time that she was out, she walked several squares going to and from his office. She had insisted on walking, as she thought she would prefer it. She walked, however, with great difficulty, her gait was very slow and feeble, and she staggered so much that she had to lean heavily upon the arm of the person who was with her to keep herself from falling.

I examined Miss A. on May 4, 1893, and found a well-developed healthy-looking woman. She was dull and hard to

arouse. It was difficult to get her attention, and she answered questions slowly and with apparent indifference. There was generally a long interval between the question and answer and the replies seemed to be made at random. She said that she had pain in the head, and placed her hand on the forehead to show where the pain was. At times the pain seemed intense. There was marked paresis of the right side of the face, which was more apparent when the patient smiled. The right eye, however, could be fully closed. Sensation was impaired on the right side of the face, but was not lost. The point of a pin could not be distinguished from the head, but localization was good. The tongue was protruded straight. The grasp of the right hand was almost equal to that of the left. Sensation in the hand and arm was not affected. There was some awkwardness in the use of the hand, and the patient kept moving the fingers as if they felt unnatural, but she could not be made to say that there was any unusual feeling in them.

She moved the legs freely in every direction and felt and localized touch in them, but in attempting to walk staggered considerably and would have fallen if she had not been supported. The knee-jerks were exaggerated, but there was no ankle clonus. The patient slept heavily a large part of the time and was difficult to arouse; but at times was extremely restless.

The bowels were regular and the urine passed as usual. The urine contained no albumin or sugar.

The appetite was large, almost voracious, and there was no nausea or vomiting. The temperature was normal, or subnormal, at times as low as 97° , and the pulse slow, varying from fifty-six to seventy beats in the minute.

Dr. Risley made another examination of the eyes about May 10, and found that the fundus was normal in both eyes. There was no nystagmus, and the pupils respond to light and accommodation.

The symptoms gradually increased in severity. The somnolence grew deeper and the difficulty in the use of the right arm increased. There was marked inco-ordination in the use

of the hand, and at times the fingers were in positions somewhat like those of athetosis. At times there appeared to be complete paralysis of the extensors of the hand with contraction of the flexors, and this condition would pass away. Later the right leg became helpless, and at intervals there was loss of voluntary power to move it. As the patient became worse there were involuntary discharges from the bladder and bowels. She very gradually sank, and, after being in a completely comatose condition for three days, died. Three days before death the temperature rose to 103° and rapidly went up, reaching 107° before death.

There was at no time any convulsive movement, either local or general.

There were several points of interest in the case. First, as to whether the condition of the patient was due to hysteria, or to organic disease of the brain. The gynecologist who examined her a few days before I first saw her, thought that she was suffering from hysteria, and when I made my first visit there were many features which looked like hysteria. She seemed to assume some of her symptoms.

It was evident that a careful examination that there was a gross brain lesion and the indications pointed to a growth, the entire absence of fever being against the probability of abscess. The question of localization of the tumor was the next question of importance. From the fact that one of the early symptoms had been slight aphasia followed by facial paresis, and later incomplete loss of power in the arm and leg with symptoms of intracranial pressure, as shown by somnolence and pain, it seemed probable that the growth was located in the left frontal lobe, and that it had gradually encroached upon the motor region. In this view Dr. H. C. Wood, who saw the case with me, concurred. Another point which naturally came up was the question of operation, and the family having seen a paper on brain surgery by a prominent surgeon, in one of the popular magazines, were very urgent that an operation should be attempted. The patient's general condition and the probable location of the growth, made any interference of this

kind seem inadvisable, and we decided against operation.

The sequel shows how well it was that no operation was attempted.

The autopsy was made twenty-four hours after death by Dr. C. H. Burr. The head only was examined. The skull was of normal thickness and the membranes were free from disease or hyperæmia. The surface of the brain showed no unusual appearance, and on making horizontal sections through the organ there was no unusual vascularity or areas of softening. On opening the ventricles only a small amount of cerebrospinal fluid flowed out. When the basal ganglia were exposed it was seen that on the left side the optic thalamus was as large as a hen's egg, the enlargement extending in all directions and involving the posterior part of the corpus striatum. The surface was smooth and covered with numerous large vessels. The consistency was firm and elastic.

The caudate nucleus and the lenticular nucleus are not at all involved. The internal capsule is involved only from pressure. On microscopic examination the growth proves to be a fibro-glioma.

The functions of the optic thalamus are so little understood, that the study of any cases in which this body is found to be exclusively involved, or even to a large extent the seat of disease, is of importance.

Dana¹ says that lesions of the posterior part of the thalamus will produce partial blindness. "Aside from disturbances of vision, the optic thalamus also must be considered clinically a latent region."

Gray,² referring to lesions of this body, asserts that "these can not be diagnosed.

Gowers,³ however, goes at some length into the symptoms which has been observed in connection with diseases of the thalamus. He states that slight hemiplegia has been observed

¹Text-Book of Nervous Diseases, p. 232.

²Nervous Diseases, p. 126.

³Diseases of the Nervous System, p. 714.

when the disease has been near the middle third of the thalamus; and that also when this portion is involved, mobile spasm is liable to exist on the opposite side of the body, chiefly in the hand. He observes that as to sensory changes, "these do not exist when the disease is limited to the thalamus, but that hemianæsthesia occurs when the lesion has extended to the internal capsule outside of the pulvinar; and that in such cases, there may also be hemianopsia." He also believes that this symptom may be caused by disease limited to the posterior part of the thalamus. In a case which I shall report, hemianopsia was not present.

Meynert thought that muscular sensibility is affected by disease of the thalamus.

Within the past few years a number of cases have been recorded in which, post-mortem, the thalamus has been found diseased, but the symptoms have varied greatly. Of course, the lack of uniformity in the symptoms depends on the involvement of parts adjacent to the thalamus and of necessity, it can occur but rarely, that the thalamus is the exclusive seat of disease. Lesions of the thalamus frequently extend into the internal capsule or into the pons and thus give rise to symptoms characteristic of disease of these parts.

Ott has made some interesting observations in regard to the thalamus as a heat center. His experiments on rabbits showed that irritation of the anterior and inner portion of the thalamus caused marked rise in the temperature of the animal. His observations have been confirmed by other observers. In this connection it is interesting to note that in the case which I shall relate later, the temperature at first was subnormal, and before death became enormously elevated.

Lloyd¹ has reported a case in which there was a glioma of the left optic thalamus, but also involving the mid-brain adjacent. In this patient there was brachial and crural monoplegia, with paralysis of the left third nerve. There was intense hebetude, so that the examination of the sensory conditions

¹Journal of Nervous and Mental Diseases, December, 1891.

was unsatisfactory; but it is stated that there was no apparent anæsthesia, and that there was an active reflex to sensory irritation.

Dercum⁵ has also made some interesting observations on a case of tumor of the thalamus. In this case the tumor involved principally the pulvinar, but to some extent the caudate nucleus, and there was some evidence of pressure upon the posterior third of the interior capsule. The patient had hemianopsia, loss of vision, and the Wernicke pupillary reaction, but no optic neuritis. There was complete hemiplegia and hemianæsthesia on the side opposite the lesion. In the early history of the case there were athetoid movements of the right arm.

Dr. Robert T. Edes⁶ relates a case of tumor of the thalamus. The patient, a man of 24, had shown symptoms of brain disease for a period covering six months. At the autopsy nearly the whole left thalamus was found involved by the growth. The caudate nucleus was pushed forward by it, and the hippocampus was also compressed, but was not involved. The posterior part of the posterior limb of the internal capsule, however, was invaded by the growth. The tumor was a gliosarcoma. The prominent symptoms presented by the patient were a sense of numbness and heaviness of the right side, with anæsthesia later in the history of the case. There was slight paralysis of the left side of the face and body, but this was somewhat intermittent. There was headache and dullness of the mental faculties, persistent vomiting, and one or two attacks of unconsciousness. Sleepiness and stupor were conspicuous symptoms. There was some diplopia, but no optic neuritis, and the fields could not be determined owing to the patient's mental condition, but vision seemed normal. Pupils reacted equally to light. There was some forgetfulness of names, but no actual aphasia. There were no choreic movements.

The writer gives brief histories of nine cases which he has

⁵Journal of Nervous and Mental Diseases, August, 1890.

⁶Medical Record, May 24, 1890.

collected, in which there was a tumor of the optic thalamus. In these there was no uniformity of symptoms, but the symptoms most commonly observed were somnolence and impaired sensibility, and paresis on the side opposite that on which the tumor was found. Disturbance of vision was noted in a comparatively small proportion of these cases. It must be stated, however, that in most of the cases quoted there was more or less involvement of the lateral capsule and corpora quadrigemina, and hence the symptoms of paresis and hemianæsthesia may be ascribed to the lesion of the internal capsule.—*University Medical Magazine.*

TUMOR OF THE IRIS.¹

BY J. SCHNEIDER, M.D., MILWAUKEE, WIS.

Tumors of the iris not caused by infection, such as syphilis or tuberculosis are very rare in our clinical experience, and when seen the majority have arrived at that stage of development when the integrity of the eye has been so changed that in order to arrest farther and more serious consequences there remains but one alternative, that of enucleation. In the literature on the subject I have not been able to find a similar case, and in my personal experience but this one, where after the removal of such a tumor from the iris there has remained useful vision; and in the light of these facts I consider the following case very unique in its clinical and anatomical results:

Miss M., of Iron Mountain, Mich., consulted me with reference to a disturbance in the vision of her left eye. On awaking the morning of March 29, 1892, she noticed the sight of the eye much reduced and objects seen with it appeared a dark red color. On March 30, 1892, the patient came to me, when I found the following conditions: R. E., normal; L. E., ability to distinguish the movement of a hand at ten feet; peripheral perception of light normal; no pain; no inflammatory symptoms. The anterior chamber was filled with blood; external layer of the cornea normal, but the lower temporal quadrant of the middle and internal layers were hazy, the haziness extending four or five mm. into the cornea; tension somewhat increased.

After ten days' treatment the blood in the anterior chamber

¹Read in the Section on Ophthalmology, at the forty-fourth annual meeting of the American Medical Association.

had disappeared, at which time I was able to make an examination of the deeper structures. The vision was $\frac{20}{xxx}$; colors and field of vision normal. In the lower temporal quadrant of the anterior chamber was lying a mass partially filling in the space between the iris and cornea, but touching the cornea near the corneo-sclero junction only, thus leaving a shallow anterior chamber above the growth. It could plainly be seen that the neoplasm had its origin in the ligamentum pectinatum iridis, and extending nearly to the sphincter pupillaris, filling almost completely the lower temporal quadrant. In consistence it appeared medullary, reddish yellow in color, shaped similar to a half coffee bean with the flat side lying directly upon the iris. The portion of the growth nearest the corneo-scleral junction being pressed upon by the cornea was flattened and grayish white in appearance; the remainder appearing very vascular and studded with papillæ. When a light was reflected directly upon the growth it could plainly be seen that the tumor grew directly out from the iris. The longest diameter was 9 mm., the shortest 5 mm. The crystalline lens and vitreous were apparently normal; reaction of pupil to light, and appearance of iris as far as the periphery of the tumor, were normal. The outline of the optic disc in the lower temporal quadrant was blurred; this cloudiness, for the distance of a disc diameter, extending into the retina and finally blending by means of white streaks in the normal tissue of the retina.

The patient was 16 years of age, menstruated regularly since her twelfth year, rather anæmic, had never had any severe illness, body well nourished, family history tuberculous, but repeated examinations for symptoms of phthisis and syphilis always giving a negative result.

The parents state that at the age of 5 years the girl was injured in the left eye with a fork; five months later they noticed a small brown spot near the pupil. This spot did not change till four years ago when with no apparent cause it assumed a flesh color and began to increase in size. After several examinations I recommended, especially on account of the family history, that the growth be removed, but it was not agreed

to by the parents and for some time the patient passed away from observation.

On March 24, 1893, the patient returned, complaining of a dull pain in the eye, tearing, sensitiveness to light with recurrent hæmorrhages (the patient could produce a hæmorrhage at will by pressure upon the growth). During the period of her absence the neoplasm had grown in all directions extending upwards so as to cover one-third of the pupil; tension increased, cornea hazy and vision reduced to less than one-half of the normal. The optic disc and retina showed marked symptoms of pressure atrophy. We have to take into consideration that we have before us a solid, flesh-colored tumor, very vascular and probably not the product of a general dyscrasia. The tumor is indefinitely located, non-pigmented, the surrounding parts, *i. e.*, the iris showing no pathological changes.

On account of the family history I was inclined to consider it a solitary tubercle or so-called granuloma. The negative results of the physical examinations would not be positive proof against a tubercle, for we know from Gradenigo, Perls, Haab, Cohnheim, Knapp and others that tubercular degeneration can be localized in the iris without any constitutional symptoms. Prudden, Haab and others affirm that granulomata have for their origin the irritating effects of some micro-organism. Second, granulomata are poorly organized neoplasms, infectious, inoculable and invade neighboring tissues, especially those with which they are in direct contact. The granuloma undergoes, on account of its poor vascularization, cloudy swelling or fatty degeneration. Aside from these authorities, the clinical appearance of the neoplasm made me doubt the existence of a tubercle. I was inclined to consider it a non-pigmented sarcoma, but the age of the patient and the clinical appearance of the growth were evidences against a sarcoma. We can immediately exclude all neoplasms of the iris such as gumma, epidermoid cyst, cystoid degeneration and melanosarcoma.

On March 28, 1893, the growth was removed in the follow-

ing manner: After the eye was thoroughly cocainized, at a distance of $1\frac{1}{2}$ mm. from the corneo-sclero junction I made a linear incision, passing partially through the base of the tumor. With an iris forceps I attempted to seize the mass but it being so fragile, only small particles could be removed; with a platinum loop I made similar attempts with the same results, it being very evident that the iris was attached to the capsule of the lens. With an iris forceps armed with a double row of teeth I seized the iris on either side of the tumor and with some little effort withdrew the large mass and attached portion of the iris out of the anterior chamber, which mass was then excised as close as possible to the base. (There still remained some parts of the growth broken off by the manipulations, in the anterior chamber) After the growth and the attached part of the iris were excised there followed a severe hæmorrhage. After the hæmorrhage had ceased and the lips of the wound were adjusted, I applied a pressure bandage and put the patient to bed. During the healing process the eye showed but very little reaction and on April 23, 1893, the patient was discharged with tension normal, and, with the exception of a small zone, the former corneal haziness had disappeared, some pigmented spots upon the capsule in the coloboma; lower temporal quadrant of disc pale, retinal changes disappeared and vision

²⁹/xxx.

The tumor measured 7 mm. in its longest diameter, 5 mm. in its shortest and 3 mm. in thickness; its superficial surface was uneven grayish-white, with the base showing normal appearance of iris. After its removal the tumor was placed in a sodium-chloride solution, and shortly afterwards given to Dr. Tower, of Milwaukee, for microscopical examination, who reports as follows:

"I took small particles, every precaution being taken to prevent them from being contaminated and planted them in tubes of agar, blood-serum, gelatin, and in bouillon both acid and alkaline, and kept them at 37 degrees centigrade and also at about 20 degrees centigrade for several days, and was unable to get any growths except in one tube a little penicellium

which was a contamination from without, either from the air or some of the utensils used. I examined stained preparations for the tubercle bacilli with negative results; in fact, did not find any germs at all or evidence of them.

"I have made examinations directly of small portions when fresh, under the microscope, and found a connective tissue and epithelial growth from apparently the iris. Upon section and examination, I find the growth to be a papilloma originating from the sub-epithelial connective tissue of the iris."

We understand by a papilloma, a neoplasm composed of connective tissue with epithelial covering; with very complete vascularization, resembling in construction skin, intestinal and mucous membrane papillæ (Wagner). Papilloma start usually from an injury, producing increased circulation to the part, causing a similar irritation to that produced by dirt in the formation of warts and by decomposing glandular secretions in the formation of condylomata. Such a papilloma may originate in any tissue as they are found in cystic tumors of the broad ligament (Mouillin), the skin, tongue, larynx, conjunctiva, fore-skin, glans penis, rectum, synovial membranes. If the tumor under consideration had been a leprous, tuberculous or actino-mycotic growth, the germs characteristic of these growths would have been found. If it had been any of these, or a syphilitic growth or a rhino-sclerotic, the particles remaining in the anterior chamber would have developed into a new growth.

I consider the prognosis in this case very favorable; especially on account of the age of the patient if there were particles remaining there would be no probability of the formation of a villous carcinoma, into which the papilloma sometimes develop.—*Journal of the American Medical Association.*

CATARACT EXTRACTION WITH THE IRIS RETRACTOR.¹

BY FRANCIS VALK, M.D.,

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Hospital, Etc.

Since the early part of 1887 I have performed the operation for the removal of cataract by a method somewhat different from that usually adopted.

This I have placed before the profession at the Post-Graduate School, at the State Society, and also at the meeting of the New York Academy of Medicine; but, owing to unforeseen circumstances, there has been no opportunity for my colleagues of New York City to criticise or to discuss the merits or demerits of the retraction of the iris and the removal of the lens *at the same time*. I have therefore asked the honor and the privilege of bringing this matter before the Congress, that it may meet with a full and fair discussion.

I shall always highly appreciate the opinions and suggestions of those who entered this special branch of surgery before I attempted to step on the first round of the ladder of fame, as well as the remarks of those who are working side by side with me in trying to advance this noble art, even though our efforts may not meet with the approval of all. Still, we hope these are but steps forward, if I may call them such, that they may some day fall into the hands of men who may so improve them as to produce far better results.

I do not propose to discuss the merits of the different meth-

¹Read before the Section in Ophthalmology of the First Pan-American Medical Congress.

ods for the removal of the sclerosed lens which intercepts the rays of light, nor the special features of an operation with or without an iridectomy, as the advantages of a round and normal pupil are well known and obvious. Nor yet do I believe there will ever be a day when the conscientious surgeon will adhere strictly to only one method of operation, but will always adopt that which he thinks best for the ultimate good of his patients.

Therefore it is my intention in this paper to suggest some thoughts and a method that have occurred to me in the course of my limited number of operations, and to explain the use and advantages of the simple little instrument, "the iris retractor," that I have used whenever possible during the past four years.

As regards the *time to operate*. I think this should be decided, when we find the cataractous lens sufficiently hardened to admit of its ready removal, without any reference to what the vision in the other eye may be. If our patients are willing to have an operation performed, even though the vision may be good in one eye, say $\frac{20}{1,XX}$, then you are justified in taking the slight risk there may be of failure, for the benefit of the improved binocular field of vision. The blindness on one side renders our patients at a disadvantage, as some of my cases will show; at the same time we make a useless eye ready for practical vision when its fellow lens becomes opaque.

Preparation for the Operation.—We may do nothing as regards the ultimate success except so far as we may have the mind of our patients completely at rest. In the light of the present statistics, the chances of failure in a healthy eye, if a cataractous eye can be healthy, are very small, as you may readily see by the reports of cases lately published. So I do not in any way prepare my cases beforehand, and particularly avoid the use of atropine before the operation.

Operation.—At the time when I am ready for the operation I instill a sufficient quantity of a solution of cocaine (four per cent.) to render the cornea anæsthetic, but not to dilate the pupil. The patient is then placed on a steady table or bed with a good clear light on the eye, and the lids are opened

with the speculum. The eye is then washed with a solution of boric acid, while my instruments are all placed in boiling water and then on a clean towel and covered until wanted.

Section.—This I consider the most important part of the operation, as upon a good section, I believe, depends the ultimate success. This should be in the same plane, except at the finish, as I shall describe. I wish to avoid the conjunctival flap, and by the perfect coaptation of the wound in the cornea we may avoid slow healing, septic infection, and prolapse or incarceration of the iris. I make the section either upward or downward according to the eye to be operated upon—as upward in the right eye, downward in the left, or, if the operator is ambidextrous, then both sections may be made upward, as I consider the upward section preferable. I prefer, in making my section, to cut always toward myself, for in so doing we produce a much smoother and clearer cut. I always make the puncture and counterpuncture wholly within the corneal tissue, through the transparent margin, about one millimeter from its periphery, and so that the cutting edge of the knife will just cover the pupillary edge of the iris on the side toward which I propose to make the section. If possible, I rapidly make the section of the cornea with three distinct cuts: first, carrying the point of the knife, as soon as the counterpuncture is made, upward and forward, cutting one side of the cornea; then the heel of the blade is drawn upward and backward, so cutting the opposite side; then, turning the knife on its long axis, the section is completed with the third cut by pushing the knife steadily forward until released. I think De Wecker, of Paris, first suggested this method, and I prefer it to all others. As I complete the section in the above manner, the knife comes out some distance from the scleral junction, leaving room for the iris to be tucked in when drawn back by the retractor.

At this time we may have prolapse of the iris; if so, it must be returned with the spatula if we wish to save the iris; but, if not, then it may be drawn out and cut off if we decide an iridectomy is best. Another complication that may occur at

this stage, particularly in very old people, is the rupture of the capsule or the zone of Zinn with the presentation of the lens at the section; if so, it must be removed at once by pressure on the cornea. I am inclined to think that should there be any tendency to prolapse at this stage, it is better to perform an iridectomy at once, to prevent any future prolapse as the healing process proceeds. If no complications arise, I then proceed to open the capsule by a peripheral incision, passing the cystotome inward to the pupillary space, then under the iris, and sweep it around beneath the edge as to cut the capsule in more than one-third of its periphery on the same side that the section has been made.

My next step is the drawing back of the iris and the extraction of the lens. At this point I wish to say a few words in reference to my method of the retraction of the iris with the little instrument called the "iris retractor," which I now present, claiming that I first adopted and practiced this method. In the *Archives of Ophthalmology*, May, 1888, page 60, Dr. Herman Knapp states that before and since he read his first paper on this subject, he had drawn back the iris toward its periphery, where he found that membrane somewhat rigid, using the small wire loop; but he does not state that he held the iris *drawn back* until the lens was removed, so I infer that he simply drew it back to relieve its rigidity, or to break up any adhesions that may have formed between the iris and the anterior capsule.

Again, I find an article by Dr. Barton Pitts, of St. Joseph, Missouri, in the *Medical Record*, October, 1890, wherein he describes a method of operation by which he draws back the iris with the same wire loop which Dr. Knapp used, and held it there until the lens passed out by pressure on the cornea. In the same paper Dr. Pitts criticises my retractor, when, according to his own admissions, he has never seen my instrument, nor does he even know its construction, but has simply followed out my ideas of drawing back the iris and holding it *tucked back* until the lens is removed. He does not give me

the credit of having first adopted that procedure, though his ideas may be original with himself.

I will quote Dr. Pitt's words: "By Dr. Valk a distensible shield with two knobs is proposed. The method of its manipulation is to insert through the corneal wound, cover the surface of the iris, and, by the knobs holding in the pupil, retract the iris upward as far as necessary and slide the lens over the front surface of the shield. Dr. Valk reports good success with it. I have not tried it, nor am I familiar with its pattern except from description. I should think, however, it objectionable on the score of occupying considerable space, already too limited. Its insertion, moreover, I think awkward, and, in the event of sudden movement of the eye under operation, its presence in the anterior chamber especially dangerous. * * *

To overcome the resistance of the iris and frequent rigidity of the pupil, I have for two years resorted to the same instrument recently mentioned by Dr. Knapp as used by him—that is, a fine wire loop attached to a delicate handle. This instrument, which can be easily and thoroughly sterilized, I insinuate through the corneal wound into the pupillary space and retract the iris into the superior triangular space, and by a gentle pressure backward and upward of a strabismus hook, applied against the lower edge of the cornea, I have little difficulty in the delivery of the lens and without material injury to the iris, and in no instance accompanied by loss of a single drop of vitreous, or followed by septic infection of the eye." I have quoted his remarks thus fully that you may note the different methods, and also if this little instrument is at all objectionable because it occupies too much space, or is especially dangerous in any sudden movements. I have never found it so, and in reality this retractor of mine does not take up any more room than the wire loop; nor is it *awkward* in any sense, as it can be easily removed from the eye by simply tipping up the ends of the blades, thus instantly releasing the iris, and at once removed if necessary.

It seems to me that the construction of this little instrument is extremely simple, having only two small smooth knobs on

the ends of a forceps with crossed action, and the size of the ordinary iris forceps. These little knobs, standing at right angles to the axis of the ends of the blades and pointing downward, simply hold the iris tucked back in the superior triangular space until the lens passes into the corneal wound, when the iris is at once and easily released.

When we consider the ease with which the lens passes out and the slight pressure required on the cornea—so much less than in the simple extraction universally adopted at the present day—I feel justified in claiming some merit and originality for this little retractor.

The eye being now ready for the extraction of the lens, it is grasped by the fixation forceps, directly opposite the section, and held steady by a careful assistant. I now take the retractor in the left hand, and, with the blades closed and the set screw so arranged that the blades will open to about the diameter of the pupil, I insinuate the ends through the section to the pupillary space. The blades are now opened by pressure and the iris is drawn back and tucked beneath the edge of the lower corneal section. Holding it steady in that position, a slight pressure is made on the opposite side of the cornea by a spoon or hook, causing the lens to rise up and easily pass out over the ends of the blades. As it does so, and as soon as the lens presents itself at the section, the retractor is pushed slightly inward, at once releasing the iris. The retractor is then generally removed with the lens lying in the cavity of the blades. As the lens clears away, we find the iris back in its position, not injured in any way, nor has it been exposed to the air, as may occur in simple extraction.

In case there should be any cortex remaining which I do not think will be absorbed or will interfere with the vision, I have reintroduced the retractor, and, drawing back the iris again, these masses are easily pressed out with the spoon. This completes the operation, and, the section being in perfect apposition, the speculum is removed, the eye gently closed, and the bandage applied.

After-Treatment.—There seems to be much diversity of

opinion as regards the method of after-treatment of an operation at the present day as there is in the methods of operation, even so far as not to use any bandage or dressings of any kind. I note that Professor Knapp does not close the eye until about half an hour after the operation, in order to see if there is any tendency of prolapse. He only applies the cotton and isingglass slips, while Chisolm, of Baltimore, does not even apply any cotton; but as I have watched the healing process of my cases and noted the different conditions under which my patients have from necessity been placed, I am inclined to think that it is best to take a "happy medium" with a decided modification of the old strict method in use some years ago. Our first consideration must be the ultimate success of the operation, and next the daily comfort of our patients as the healing process proceeds. Bearing these two points in mind, it seems to me that there will be fewer movements of the eye and consequently less pressure on the sclera by the straight muscles if we close both eyes with a neat-fitting flannel bandage, with pads of absorbent cotton over the eyes. The slight restraint of a day or two in bed will not cause any distress, while the rest and quiet will assist in the rapid healing of the large corneal wound. I do not doubt but that those who use the modified dressings have as good success as can be wished for, though the above ideas seem to me the best that we may employ to complete the healing of our patients, according to the old motto, *Tuto, cito et jucunde*.

I remove the bandage from the eye not operated upon at the end of forty-eight hours, or on the second day, as I do not wish, nor do I see any need, to keep these old people in the dark any longer than is absolutely necessary.

In my last four cases I have tried to carry out my idea of non-interference still further, as I sometimes think that atropine may irritate an eye which has been operated upon for cataract, and lately I have not used this drug unless necessary—that is, when there were indications of commencing iritis; but I have changed the bandage every twenty-four hours, washing the lids carefully and gently with warm water, apply-

ing a little vaseline to the edges of the lids, and then replacing the bandage.

Now I wish to make another suggestion in reference to that desire, which we perhaps all have, to look at the eye and to see the result of our work. Is it not better to leave the eye alone until all possible danger of complications has passed? Some of us have noted an opening of the wound with prolapse of the iris as late as the sixth day after the operation. Therefore I have decided to simply change the dressings every day for about ten days, unless there are some indications otherwise, and then open the eye in a darkened room, gradually accustoming it to light by the use of smoked glasses.

Professor P. D. Keyser, of Philadelphia, and Dr. W. Buss, of Bradford, Pa., have used my retractor in several cases and have reported to me good results, each being pleased with the easy exit of the lens and the rapid healing of the wound in the cornea.

In conclusion, I do not think the surgeon who considers the best interests of his patients and the various conditions that may arise during an operation for the removal of cataract will persistently adhere to any one method of operation. In my own cases I have been compelled to lay aside the retractor in four cases out of thirty-three. So the surgeon must adopt that method which to him at the time seems best for the ultimate success, either with or without an iridectomy; but we can adopt some method and endeavor to carry it out, unless we find it will endanger the final results.

Some of my cases have required a subsequent discision; but as each case of that kind requires special study and methods in itself, I will not make any particular reference to it, except so far as I consider Dr. Knapp's remarks as to the operation, delivered at Detroit, as the best, and giving the final results required.

In all my cases I have used the *retractor*, though some of them have presented indications almost against its use; but the final results have seemed equal to those of any other method, while in four cases not reported I could not use the retractor

and the final results were not as satisfactory, and in one case, where I performed an iridectomy, the end was total loss.

This method is perfectly safe and the retractor can, if necessary, be quickly and easily removed from the eye, while the objection once raised, that it is another instrument introduced into the eye, is not tenable, as this instrument is so easily sterilized, and, besides, I think there is less manipulation of the iris than in simple extraction, particularly if the iris is prolapsed at the exit of the lens.

Final results in twenty-nine cases: $\frac{20}{20}$ —, 1; $\frac{20}{30}$, 2; $\frac{20}{40}$, 8; $\frac{20}{50}$, 5; $\frac{20}{70}$, 3; $\frac{20}{100}$, 4; shadows, 4; no result, 1; no test, 1.

I will close by stating that by this method I do not meet with any more accidents or risks, or loss of vitreous, etc., than usually occur by other methods, and I believe that with careful use the retractor, as I now present it and as I have used it for the past four years, will be of material service to the ophthalmic surgeon in the removal of a cataractous lens.

The instrument may be procured from E. B. Meyrowitz, of New York.—*New York Medical Journal*.

THE PROXIMATE CAUSE OF THE TRANSIENT
FORM OF MYOPIA ASSOCIATED WITH IRITIS.
WITH REMARKS ON OTHER FORMS OF
SYMPTOMATIC AMETROPIA.¹

BY A. SCHAPRINGER, M.D.

The clinical fact that iritis in a considerable proportion of cases is apt to occasion a transitory myopia of low degree—about 1.5 D. to 2.0 D.—was first put on record by Dr. John Green, of St. Louis, the well-known authority on questions connected with refraction. Since the time that he read his paper on this subject before the American Ophthalmological Society in 1887 his discovery has been verified by a large number of other observers.

As to the proximate cause of the increase of refraction as a symptom of iritis Dr. Green did not offer any speculations.

In a paper on Symptomatic Myopia, read before the American Ophthalmological Society in 1888, Dr. W. F. Mittendorf advanced the theory that this transient increase of refraction was the result of an infiltration of the anterior portion of the vitreous body, increasing the bulk of this organ to such a degree as to push the lens system forward and with it the posterior principal focus of the eye. This theory I do not feel inclined to adopt, because as long as the tensile strength of the suspensory ligament of the lens remains unimpaired, an increase of pressure in the vitreous chamber would have to be very great indeed to displace the lens forward. The globe would feel very hard on palpation, other symptoms consequent

¹Read before the Section in Ophthalmology and Otology of the New York Academy of Medicine, October 16, 1893.

upon increase of tension would be present, and there would be hardly any difference in the clinical pictures of iritis and acute glaucoma.

According to another theory, the increased refraction is said to be due to an augmentation in the corneal curvature produced by the increased pressure of the lids in consequence of the great photophobia. The negative results of ophthalmometric measurements completely disprove this theory.

Still another hypothesis alleges a spasmodic condition of the ciliary muscle as the cause of the symptom in question. This hypothetical cause forming the base of certain therapeutical recommendations lately made by Dr. Charles A. Oliver, of Philadelphia,² the question of the correctness of this hypothesis must henceforth be regarded as not merely of theoretical but also of practical interest.

Dr. Oliver insists that the refraction of the eye should be carefully and repeatedly tested in the course of an attack of iritis, and that instillation of strong mydriatic solutions should not be discontinued as long as the increased refraction persists, even after the pupil has been fully dilated. The presence of myopia proves the presence of spasm in the muscle of accommodation, and this being a pathological condition, it needs to be combated by the appropriate means at our disposal.

Now, Dr. Green has already pointed out that the fact that the increase of refraction persists for an indefinite time after the pupil has fully yielded to the action of atropine was a proof militating against the assumption that the transient myopia was due to spasm of accommodation. Besides this argument advanced by Dr. Green, the supposition that inflammation will cause a spasmodic contraction of the ciliary muscle is contrary to all physiological experience in regard to analogous conditions elsewhere in the human organism. To bring forward only one example, let me refer to the behavior of the muscular coat of the intestine in peritonitis, where it is any-

²La correction exacte des vices de réfraction dans l'iritis plastique. *Annales d'oculistique*, January, 1893.

thing but contracted. On the contrary, it is completely paralyzed, and by its paralysis causes two of the main symptoms of the disease, tympanites and constipation. The contraction of the pupil in iritis is not due to spasm of the sphincter iridis muscle, but is only dependent on the swelling of the tissue of the iris in consequence of hyperæmia and infiltration. It is also a very significant fact in connection with the question here discussed that in the insidious forms of sympathetic iridocyclitis the first sign of impending trouble is the *diminution* of the power of accommodation, causing recession of the near point.

Having dismissed all the theories hitherto enumerated as unsatisfactory, it behooves me to substitute one against which no valid objections could be raised. I think that the transient myopia of iritis can be best explained by a temporary increase of the refractive index of the aqueous humor. That the composition of the contents of the anterior chamber in iritis differs from that in the normal state is not a hypothesis, but a fact. The formed particles suspended in the aqueous humor, rendering its aspect turbid, will, of course, have no influence upon the refraction of the eye. We are here concerned only about the transparent part of the liquid. Judging from the deposits, among other substances, of fibrin upon the walls of the anterior chamber, nothing would seem more plausible than to assume that in iritis the aqueous humor contains this substance in more than the normal quantity. If this is the case, it follows from physical laws that its index of refraction must be increased. A higher index of refraction of the aqueous will produce myopia, because the beams of light which receive an inclination toward the optical axis, when refracted at the anterior corneal surface, will receive an additional inclination toward this axis at the posterior corneal surface. In the normal state there is no refraction at this surface, because then there is no difference between the refractive indices of the cornea and of the aqueous humor. The posterior wall of the cornea in iritis represents a convex refracting surface with a medium of higher refrangibility behind it than before. Consequently

the optical conditions present at this surface will be the same in kind, though not in degree, as those present at the posterior surface.

In the refractive index of the aqueous humor of an emmetropic eye were lessened instead of increased, the inclination of the rays of light toward the optical axis would be diminished and the eye therefore rendered hypermetropic.

The question now presents itself, How much must the index of refraction of the aqueous be increased in order to produce a given degree of myopia?

In order to solve this problem, we have to take into consideration the factors coming into play at the refraction by the posterior corneal surface. The relation of the constants is expressed by the well-known formula:

$$F_2 = \frac{n_2 r}{n_2 - n_1}$$

We wish to calculate the value of n_2 , which represents the index of refraction of the aqueous humor:

$$n_2 = \frac{F_2 n_1}{F_2 - r}$$

F_2 represents the second principal focal distance of our refractive system, consisting of corneal substance, posterior corneal surface, and iritic aqueous, or, in other words, the collective power of this system. This collective power is measured by the concave glass placed before the eye, neutralizing the collective power by its dispersive power. In substituting the reciprocal value of this glass, we have to deduct the distance of the correcting glass from the posterior corneal surface.

n_1 stands for the refractive index of the corneal substance, which is 1.3365 according to Helmholtz.

r represents the radius of curvature of the posterior wall of the cornea, which, following Tscherning, we will put down as six millimetres.

Carrying out the calculation for different degrees of myopia as met with in iritis, we find the following values of n_2 :

DEGREE OF MYOPIA.	INDEX OF REFRACTION OF AQUEOUS.
1.0 D	1.355
1.5 D	1.349
2.0 D	1.353

The increase from the normal—which is 1.336—not being considerable, the figures at least do not speak against the plausibility of our hypothesis.

If we accept this hypothesis as the true explanation of the myopia occasioned by iritis, we shall refrain from continuing the instillations of atropine after the pupil has fully yielded to its action and the congestion has subsided, although the myopia may still be present. Our theory furnishes a contraindication against the persistent employment of atropine under these circumstances, inasmuch as a dilated pupil means an obstructed iris angle, and this means interference with the drainage of the anterior chamber. We shall not feel inclined to do anything to keep the morbid aqueous humor longer in the anterior chamber than necessary. Our hypothesis furthermore does not impose upon us the obligation of carefully and repeatedly testing the refraction of eyes affected with iritis, of which release we shall avail ourselves with avidity and earn the thanks of our patients.

If the myopia persists for some time after the subsidence of the inflammatory symptoms and we should feel called upon to hasten the work of Nature, massage of the eyeball would offer itself as a local therapeutic measure in consonance with our theory.

The two recognized varieties of myopia in general are axial myopia, which is the most common form, and myopia of curvature. If our theory as to the causation of the transient nearsightedness occasioned by iritis is verified, we shall have "index myopia" as a third type of this error of refraction.

To test the merits of the theory here propounded, very accurate measurements with instruments of precision rarely met with in the possession of practitioners will be necessary. Those

who have a Helmholtz ophthalmometer, or what seems to be a still more suitable instrument for the purpose, a Tscherning ophthalmophakometer at their disposal, will deserve the thanks of the profession by taking up this problem. The shortest way to determine the refractive index of iritic aqueous would be to tap the anterior chamber and test the liquid obtained by means of an Abbé refractometer; but the clinical indication for paracentesis of the cornea hardly ever arises in the course of plastic iritis.

Since we are discussing the subject of index ametropia, the question naturally suggests itself, What would become of an emmetropic eye if the index of refraction of the vitreous body be increased?

The answer to this question will be found in the following consideration:

The beams of light, striking the concave anterior surface of the vitreous, are deflected toward the optical axis to join it at the place of the retina. The strength of the deflexion depends upon the difference of the refractive indices of the crystalline body and the vitreous. The index of the vitreous being the lesser quantity, we will, by increasing it, lessen the difference between it and the crystalline index, or, in other words, lessen the inclination of the rays of light toward the optical axis. This means that the emmetropic eye is being rendered hypermetropic.

A change in the refractive index of the vitreous will therefore cause the opposite effect from that which is produced by the same kind of change in the aqueous.

In the intervals between the prodromic attacks preceding an outbreak of inflammatory glaucoma the patients usually complain of being compelled to use increasingly strong convex glasses in rapid succession for reading purposes. This is usually explained as the result of a rapid diminution in the power of accommodation, but it seems to me not improbable that this symptom may have something to do with an increase in the refractive index of the vitreous body. Such an increase in the refractive index of the vitreous body. Such an increase, as

said before, will render an emmetropic eye hypermetropic, and a hypermetropic eye still more hypermetropic. I have met nowhere with the distinct statement from any observer that, while the near point of the glaucomatous eye thus rapidly receded, the far point was found to remain stationary.

The myopia caused by diabetes is a form of myopia to which Hirschberg has called attention and which is probably also a type of index ametropia. I have myself recently met with two cases of this kind in succession—one of them in a lady sixty-one years old, referred to me by the kindness of Dr. S. J. Meltzer, of this city. The acquired myopia in both cases was of considerable degree, being more than 6 D. An increased curvature of the front surface of the lens I can hardly deem accountable for this, since the depth of the anterior chamber, at least as far as could be made out without the use of the instruments of precision mentioned before, seemed perfectly normal in both cases. A decrease in the refractive index of the cortical substance of the lens will, I think, best account for this type of myopia, if the myopia is to be accounted for by a change in this organ. Such a decrease will increase the refractive power of the lens system as a whole and thereby bring the posterior principal focus of the eye in front of the retina. It may sound paradoxical at first that the collecting power of a biconvex lens like the crystalline body should be increased by a decrease in the refractive index of one of its constituent parts. But it must be remembered that the cortical substance represents a system of concave or dispersive lenses which neutralize the overstrong collective power of the globular nucleus. By lowering the refractive index of the cortex we lessen its dispersive power, and the result will be a preponderance of the collective power of the nucleus; the principal focus of the eye is thereby brought forward and the eye made myopic.

Since writing the foregoing my attention has been drawn to a paper, "On the Presence of Sugar Within the Eye in Ex-

perimental Diabetes,"³ by the brothers Cavazzani, an abstract of which has recently appeared in the *Centralblatt f. prakt. Augenheilkunde* (supplement for 1892, p. 496). Having made experimental researches on the functions of the pancreas, these authors report the results of the chemical analysis of the refracting media of two dogs which were afflicted with a permanent form of diabetes in consequence of the extirpation of the pancreas. The animals were killed in due season and their eyeballs enucleated. In the first dog the aqueous humor contained 0.386 per cent. of sugar. In the peripheric layers of the lens very little of this substance was found, *and none at all in the nuclear portion of the lens and the vitreous body*. In the second dog sugar in the proportion of somewhat less than 0.5 per cent. was found in the aqueous humor and none at all in the other refracting media.⁴ The lenses were completely transparent and anatomically normal in every respect. The fact that the lens, at least of one of the animals, contained sugar, speaks against the theory enunciated by Deutschmann,⁵ which says that no sugar can diffuse into the substance of the lens as long as the epithelial layer of the lens capsule remains intact.

In the investigations of the Italian experimenters, at least as far as they are reported in the *Centralblatt*, no attention was paid to the refraction of the eyes during life or to the refractive index of the media subjected to chemical examination. I hope that in future investigations of the same kind these matters will not be lost sight of. The results of the chemical analysis make it probable that the aqueous humor at all events plays an important part in the production of diabetic myopia. Future investigations will have to show whether the peripheric layers of the lens are also concerned in this change of refrac-

³This is a portion of a larger work, *Le funzioni del pancreas ed i loro rapporti colla patogenesi del diabete*. Venezia, 1892.

⁴From the marked difference in the chemical behavior of the aqueous and the vitreous the authors draw the conclusion that the sources of nutrition of these two substances must be entirely distinct.

⁵V. Graefe's *Arch. of Ophthalm.*, 1887, p. 229.

tion and how far. It is very characteristic that the vitreous body of the diabetic dogs was found absolutely free from sugar. This is in remarkable harmony with what was pointed out before on theoretical grounds, viz., that the degree of myopia produced by an increase of the refractive index of the aqueous humor will not become further increased by an increase of the refractive index of the vitreous body, but, on the contrary, an increase of the refractive index of the vitreous would neutralize, more or less, any myopia caused by a change of index of the aqueous humor.—*New York Medical Journal*.

REVIEWS.

NEW TRUTHS IN OPHTHALMOLOGY AS DEVELOPED BY G. C. SAVAGE, M.D. Thirty-two Illustrations. Published by the Author. Nashville, Tenn. 1893. St. Louis, Mo.: J. H. Chambers & Co., 914 Locust Street.

In this book the author has collected, to a large extent, the papers published of late by him in his journal, the *Ophthalmic Record*. He has in this manner done a service to all who want to follow him in his thoughts, particularly on the subject of heterophoria. His language is clear and perspicuous and the illustrations are good. Whether agreeing with the author's views or not, the perusal of the little book will well repay the buyer.

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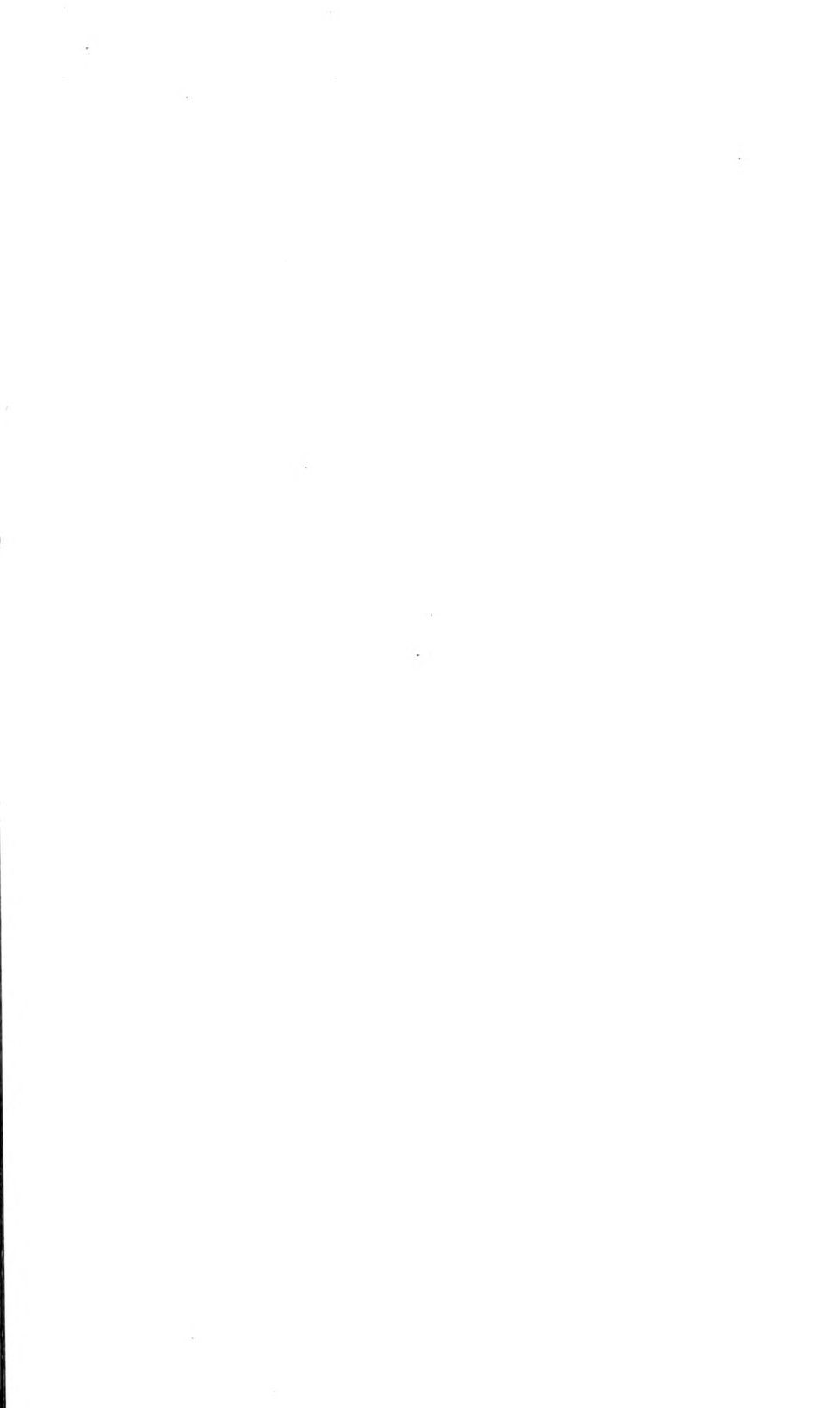
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